WMIX-QM570

Intel QM57

User Manual

Rev.01, Apr. 2012

Statement

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All product specifications are subject to change without prior notice.

Packing List

- ☐ WMIX-QM570
- ☐ Driver CD (Include user manual)

Ordering Information

- ☐ 1 x PS2 Y Cable(KB and Mouse)
- ☐ 1 x LPT Cable with Bracket
- ☐ 1 x 2 Port COM Cable with Bracket
- ☐ 1 x 2 Port USB Cable with Bracket
- ☐ 1 x SATA Cable
- ☐ 1 x SATA Power Cable

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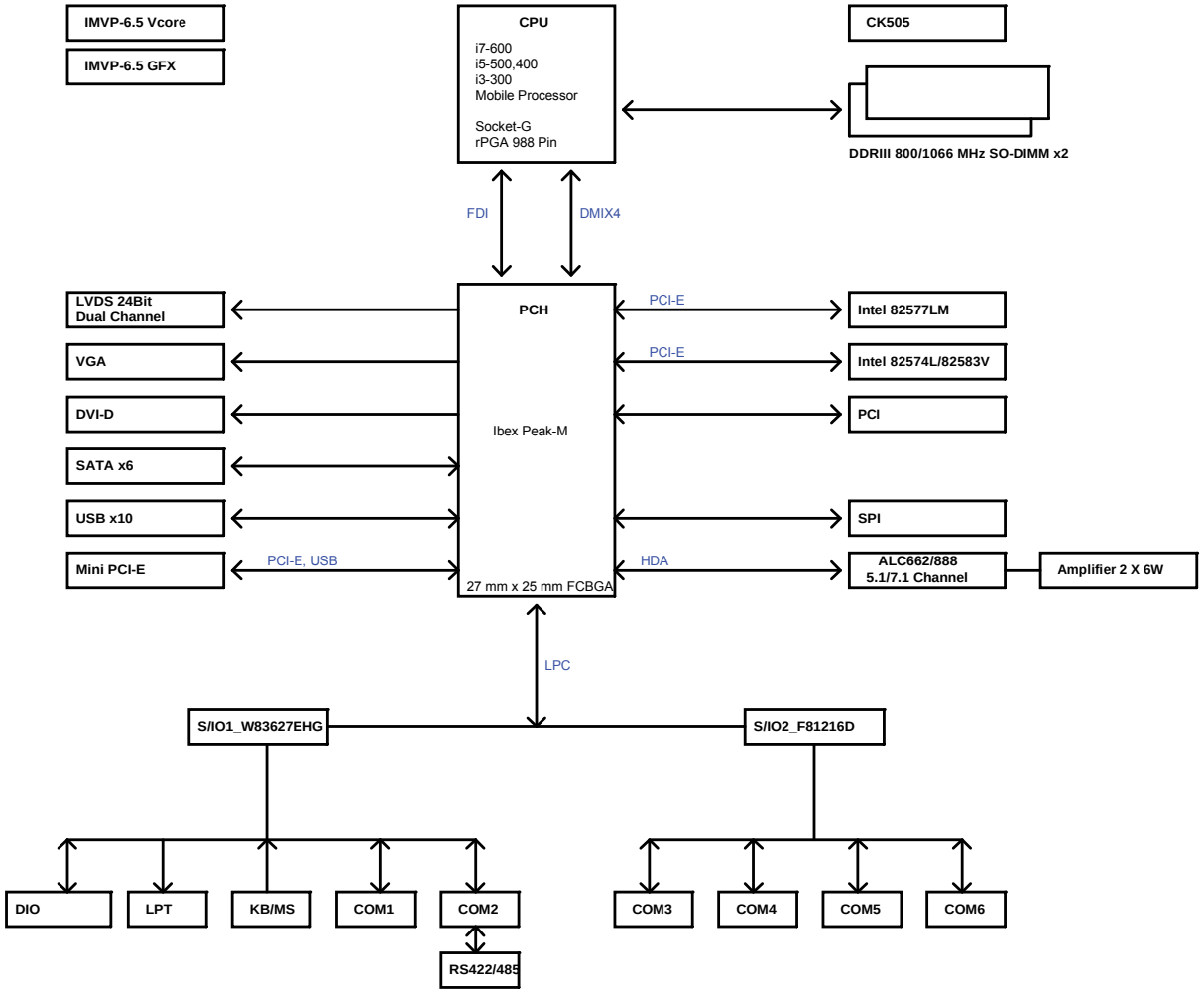
Block Diagram

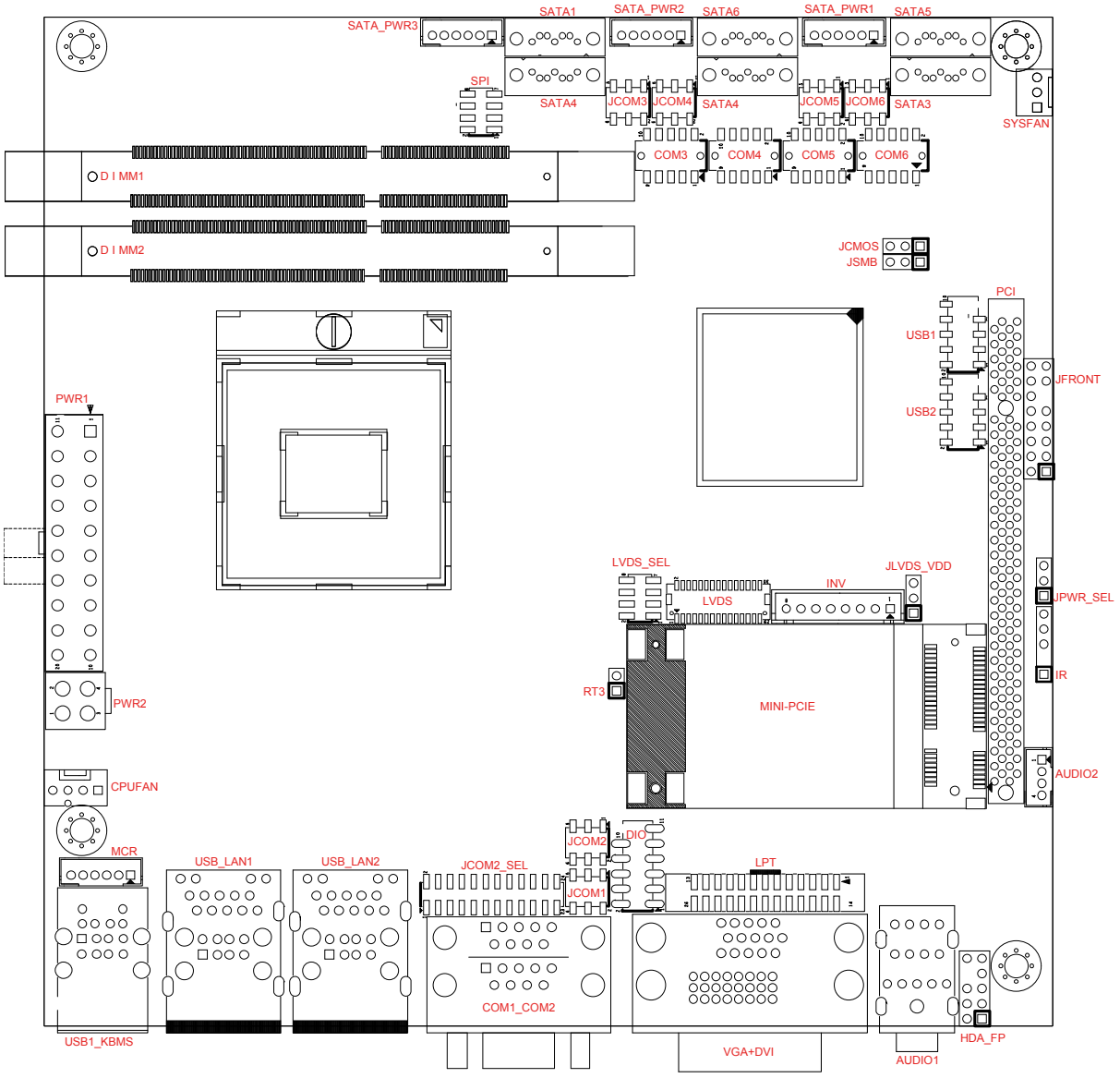


Features

System Processor/ Chipsets	Processor	Intel Core i7/i5/Celeron processors
		Socket G
	FSB	1066 MHz
	Chipset	Intel® QM57
	BIOS	AMI
Memory	Technology	DDR3 800/1066 MHz SDRAM
	Max. Capacity	Up to 8GB DDR3 DRAM
	Socket	2 x DDR3 SO-DIMM
Display	Chipset	Intel QM57 integrated HD Graphics
	VRAM	Shared system memory up to 2GB
	Resolution	Analog Display: Up to 2048 x 1536
	LVDS	18/24bit, dual channel
	LVDS Resolution	Digital LVDS: Up to 1920 x 1200
	Dual Display	CRT+LVDS, CRT+DVI
Ethernet	Interface	Dual 10/100/1000 Mbps
	Controller	LAN1: Intel 82577LM, LAN2: Intel 82574L
Audio	Interface	High Definition Audio
	Controller	Realtek ALC662 HD CODEC
SATA	Max. Data Transfer Rates	300 MB/s
	Port	6
Expansion Slot	PCI	1
	mini PCIe	1
	USB 2.0	4
	COM	4 (RS-232, supply 12V/5V/RI)

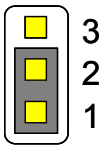
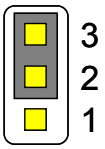
	Parallel	1
	Audio Amplifier	1(6W (4Ω) stereo)
	DIO	4 in/4 out (sink 6A x2)
Rear I/O	PS/2	1(K/B and mouse)
	VGA	1
	COM	2 (1xRS232,1xRS232/RS422/RS485); all support 12V/5V/RI jumper selector)
	LAN	2 x RJ45
	USB 2.0	6
	Audio	3 (Line In, Line out, Mic In)
	DVI	1
Power	ATX	ATX 20pin or DC 12V In
Watchdog Timer	Interval	Programmable 1~255 sec./min.
	Output	System reset
Environment *Note1	Operating Temp.	-5°C~60°C (23°F~140°F)
	Storage Temp.	-20°C~80°C (-68°F~176°F)
	Relative Humidity	0%~ 95% (non-condensing)
Form Factor	Dimension (L*W)	Mini-ITX, 170mm x 170mm (6.69” x 6.69”)

PCB Layout

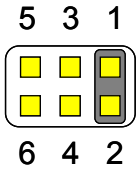
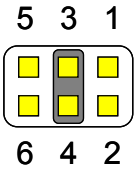
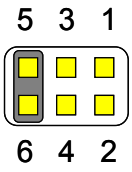

SATA_PWR3
SATA1
SATA_PWR2
SATA6
SATA_PWR1
SATA5
SPI
SATA4
JCOM3
JCOM4
SATA4
JCOM5
JCOM6
SATA3
SYSFAN
COM3
COM4
COM5
COM6
D I MM1
D I MM2
JCMOS
JSMB
PCI
USB1
USB2
JFRONT
PWR1
LVDS_SEL
LVDS
INV
JLVDS_VDD
JPWR_SEL
IR
RT3
MINI-PCIE
PWR2
AUDIO2
CPUFAN
MCR
USB_LAN1
USB_LAN2
JCOM2_SEL
JCOM2
DIO
JCOM1
LPT
COM1_COM2
USB1_KBMS
VGA+DVI
AUDIO1
HDA_FP

Jumper Setting

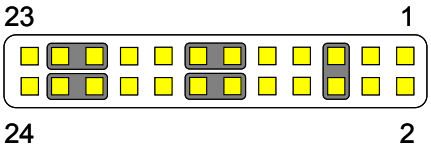
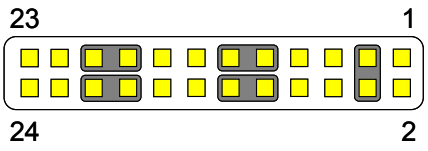
JCMOS: CMOS Clear

Pin No.	1-2	2-3
Function	Normal Operation (Default)	Clear CMOS Contents
Jumper Setting		

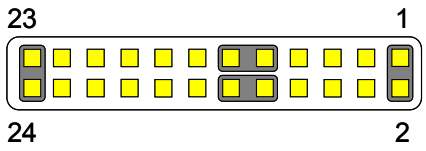
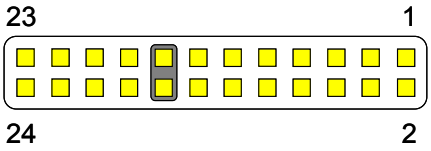
JCOM1/JCOM2/JCOM3/JCOM4/JCOM5/JCOM6: (5V/12V/RI) Select

Pin No.	1-2	3-4	5-6
Function	+5V	Modem Ring In (Default)	+12V
Jumper Setting			

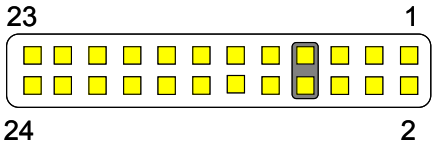
JCOM2_SEL: COM2 (RS-232/RS-422/RS-485) Select (1/3)

Pin No.	5-6, 11-13, 12-14, 19-21, 20-22	3-4, 9-11, 10-12, 17-19, 18-20
Function	RS-232 (Default)	RS-422
Jumper Setting		

JCOM2_SEL: COM2 (RS-232/RS-422/RS-485) Select (2/3)

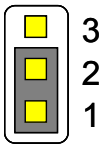
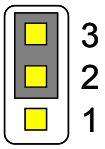
Pin No.	1-2, 9-11, 10-12, 23-24	15-16
Function	RS-485	RS-422 RX 100Ω Termination
Jumper Setting		

JCOM2_SEL: COM2 (RS-232/RS-422/RS-485) Select (3/3)

Pin No.	7-8	
Function	RS-422 TX 100Ω/RS-485 Termination	
Jumper Setting		

Note: Not Recommended for RS-422 TX 100Ω Termination.

JLVDS_VDD: LCD Power (+3.3V/+5V) Select

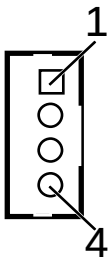
Pin No.	1-2	2-3
Function	LCD Power +3.3V (Default)	LCD Power +5V
Jumper Setting		

Connector Function List

Connector	Function	Note
AUDIO1	Line-In/MIC-In/Line-Out connector	
AUDIO2	Audio amplifier out connector	
COM1_COM2	Serial port connector	
COM3, 4, 5, 6	Serial port with box-header	
CPUFAN	CPUFAN 4-pin connector	
DIMM1, 2	DDR3 SO-DIMM connector	
DIO	Digital input/output with pin-header	
HDA_FP	Front panel audio with pin-header	
INV	LCD inverter connector	
IR	IR with pin-header	
JFRONT	Front panel with pin-header	
JSMB	SMBUS with pin-header	
LPT	Parallel port with box-header	
LVDS	LVDS connector	
MCR	MCR with box-header	
MINI-PCIE	Mini PCI express connector	
PCI	PCI slot	
PWR1	ATX 2x2 connector	For DC12V in
PWR2	ATX 2x10 connector (Reserved)	For ATX
RT3	Reserved for external thermistor	
SATA1, 2, 3 ,4, 5, 6	SATA connector	
SATA_PWR1, 2, 3	SATA power with box-header	
SPI	Reserved for debug	
SYSFAN	System FAN connector	
USB1, 2	USBx2 with pin-header	
USB1_KBMS	USBx2, PS2 Keyboard and PS2 mouse	
USB_LAN1, 2	USBx2 and RJ45 connector	
VGA+DVI	VGA and DVI connector	

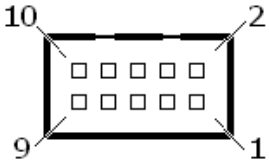
Internal Connector Pin Define

AUDIO2: Audio Amplifier Output with Wafer connector (2.0 mm)



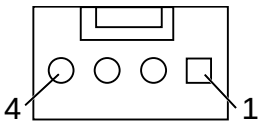
Pin No.	Signal
1	Audio Amplifier Out Right
2	Ground
3	Ground
4	Audio Amplifier Out Left

COM3/COM4/COM5/COM6: Serial Port with Box-header (2.0 mm)



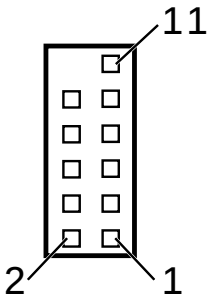
Pin No.	Signal	Pin No.	Signal
1	DCD	2	DSR
3	RXD	4	RTS
5	TXD	6	CTS
7	DTR	8,10	RI/+5V/+12V
9	Ground		

CPUFAN: 4Pin FAN connector



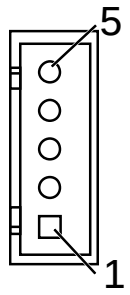
Pin No.	Signal
1	Ground
2	Fan Power (+12V)
3	Speed Sense
4	Control

DIO: Digital I/O with Pin-header (2.54mm)



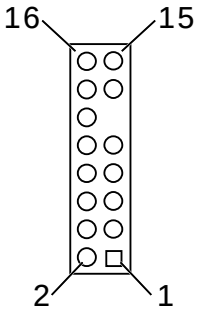
Pin No.	Signal	Pin No.	Signal
1	DIO-Out0 bit0	2	DIO-In0 bit2
3	DIO-Out1 bit1	4	DIO-In1 bit3
5	DIO-Out2 bit6	6	DIO-In2 bit4
7	DIO-Out3 bit7	8	DIO-In3 bit5
9	+12V	10	+5V
11	Ground	12	NC

INV: Inverter with Box-header (2.50 mm)



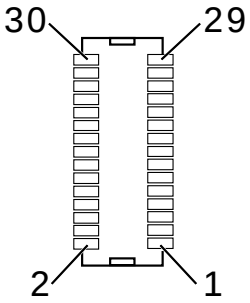
Pin No.	Signal
1	+12V
2	+12V
3	Ground
4	Inverter Brightness Abject
5	Inverter Enable

JFRONT: Front Panel with Pin-header (2.54mm)



Pin No.	Signal	Pin No.	Signal
1	+5V (470 Ohm), (Power LED+)	2	+5V (470 Ohm), (HDD LED+)
3	NC	4	HDD LED#, (HDD LED-)
5	Ground, (Power LED-)	6	5VSB (470 Ohm), (Suspend LED+)
7	RESET#, (Reset Button Pin1)	8	Suspend LED#, (Suspend LED-)
9	Ground, (Reset Button Pin2)	10	FSPK# (Beep), (Speaker-)
11	NC	12	NC
13	SW_PWR#, (Power ON Button Pin1)	14	NC
15	Ground, (Power ON Button Pin2)	16	+5V, (Speaker+)

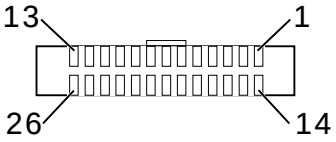
LVDS: LVDS Panel Signal with Box-header (1.0 mm)



Pin No.	Signal	Pin No.	Signal
1	Ground	2	Ground
3	LVDSA_DATA3+	4	LVDSA_DATA3-
5	LVDSA_CLK+	6	LVDSA_CLK-
7	LVDSA_DATA2+	8	LVDSA_DATA2-
9	LVDSA_DATA1+	10	LVDSA_DATA1-
11	LVDSA_DATA0+	12	LVDSA_DATA0-
13	Ground	14	Ground
15	LVDSB_DATA3+	16	LVDSB_DATA3-
17	LVDSB_CLK+	18	LVDSB_CLK-
19	LVDSB_DATA2+	20	LVDSB_DATA2-
21	LVDSB_DATA1+	22	LVDSB_DATA1-
23	LVDSB_DATA0+	24	LVDSB_DATA0-
25	Ground	26	Ground
27	LVDS Power	28	LVDS Power
29	LVDS Power	30	LVDS Power

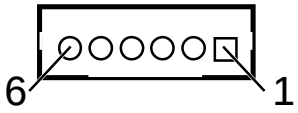
Note1：LVDS Power = +5V or +3.3V (Default)

LPT: Parallel Port with Box-header (2.0 mm)



Pin No.	Signal	Pin No.	Signal
1	Strobe#	14	Auto Form Feed#
2	Data 0	15	Error#
3	Data 1	16	Initialization#
4	Data 2	17	Printer Select IN#
5	Data 3	18	Ground
6	Data	19	Ground
7	Data 5	20	Ground
8	Data 6	21	Ground
9	Data 7	22	Ground
10	Acknowledge#	23	Ground
11	Busy	24	Ground
12	Paper Empty	25	Ground
13	Printer Select	26	Ground

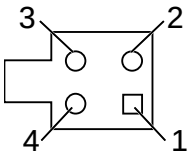
MCR: Internal Keyboard with Box-header (2.0 mm)



Pin No.	Signal
1	+5V
2	KCLK_CON
3	KCLK_KBC
4	KDAT_CON
5	KDAT_KBC
6	Ground

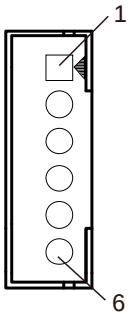
Note: If not use MCR need short (Pin2 to Pin3) and (Pin4 to Pin5) to enable PS2 Keyboard.

PWR1: ATX 2x2 +12V Input



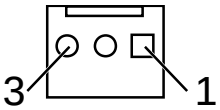
Pin No.	Signal	Pin No.	Signal
1	Ground	2	Ground
3	+12V	4	+12V

SATA_PWR1/SATA_PWR2/SATA_PWR3: SATA Power with Box-header (2.50mm)



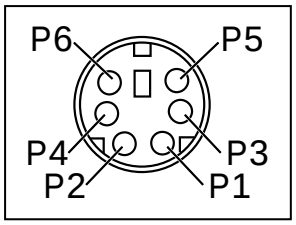
Pin No.	Signal
1	+5V
2	+5V
3	Ground
4	Ground
5	+12V
6	+12V

SYSFAN: System FAN 3 Pin connector



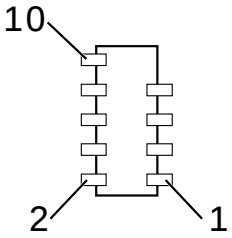
Pin No.	Signal
1	Ground
2	Fan Power (+12V)
3	Speed Sense

USB1_KBMS: USBx2, PS2 Keyboard and PS2 Mouse connector (PS2 Y-Cable)



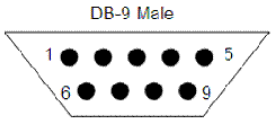
Pin No.	Signal
U1	USB Power (+5V)
U2	USB Data0N
U3	USB Data0P
U4	USB_Ground
U5	USB Power (+5V)
U6	USB Data1N
U7	USB Data1P
U8	USB_Ground
P1	PS2_Ground
P2	PS2 Keyboard Data
P3	PS2 Mouse Data
P4	PS2 Power (+5V)
P5	PS2 Keyboard Clock
P6	PS2 Mouse Clock

USB1/USB2: USB Port with Pin-header (2.54mm)



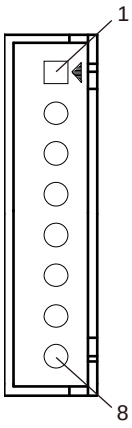
Pin No.	Signal	Pin No.	Signal
1	USB Power (+5V)	2	USB Power (+5V)
3	USB DATAN	4	USB DATAN
5	USB DATAP	6	USB DATAP
7	USB Ground	8	USB Ground
9	NC	10	Shield Ground

COM2: Serial Port Connector



Pin No.	RS-232 Pin define	RS-422 Pin define	RS-485 Pin define
1	DCD	TX-	DATA-
2	RXD	TX+	DATA+
3	TXD	RX+	
4	DTR	RX-	
5	GROUND		
6	DSR		
7	RTS		
8	CTS		
9	RI/+5V/+12V		

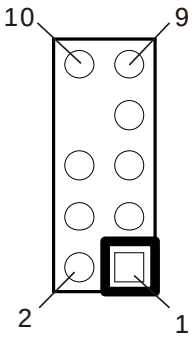
INV: LCD inverter connector with Box-header (2.50mm)



Pin No.	Signal
1	+12V
2	+12V
3	Ground
4	Inverter Brightness Adjust
5	Inverter Enable
6	Ground
7	+3.3V/+5V
8	+3.3V/+5V

Note: Mount “1x5 pin Box-header” on Pin1 to Pin5 (Default).

HAD_FP: Front panel audio with box-header (2.0mm)



Pin No.	Signal	Pin No.	Signal
1	MIC2-IN-L	2	GND
3	MIC2-IN-R	4	HAD GPIO1
5	LINE2-IN-R	6	LINE2-JD
7	HDA_FP_SENSE	8	NC
9	LINE2-IN-L	10	MIC2-JD

Chapter 2 BIOS Setup

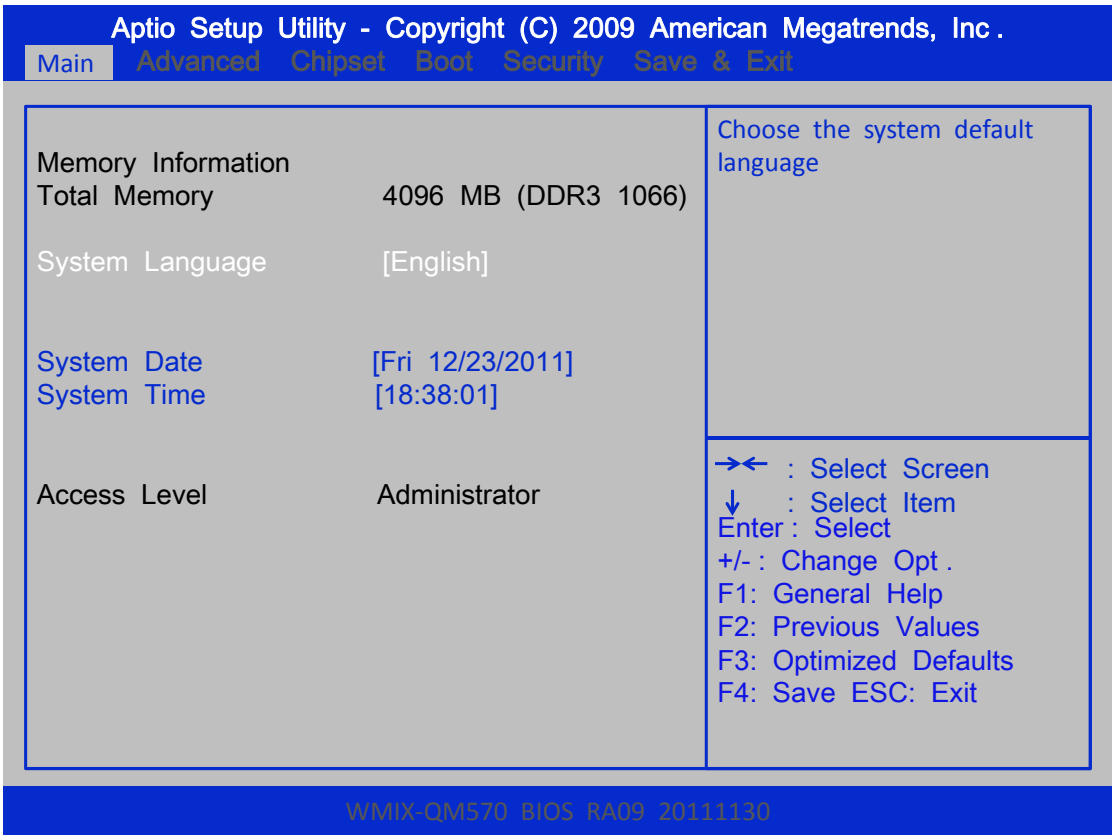
This chapter introduces BIOS setup information.

Power on or reboot the system board, when screen appears message as “Press DEL to enter SETUP“. Press <DEL> key to run BIOS SETUP Utility.

Note: The BIOS configuration for reference only, it may subject to change without prior notice.

2.1 Main Menu

Please choose the system default language.



☐ **Date**

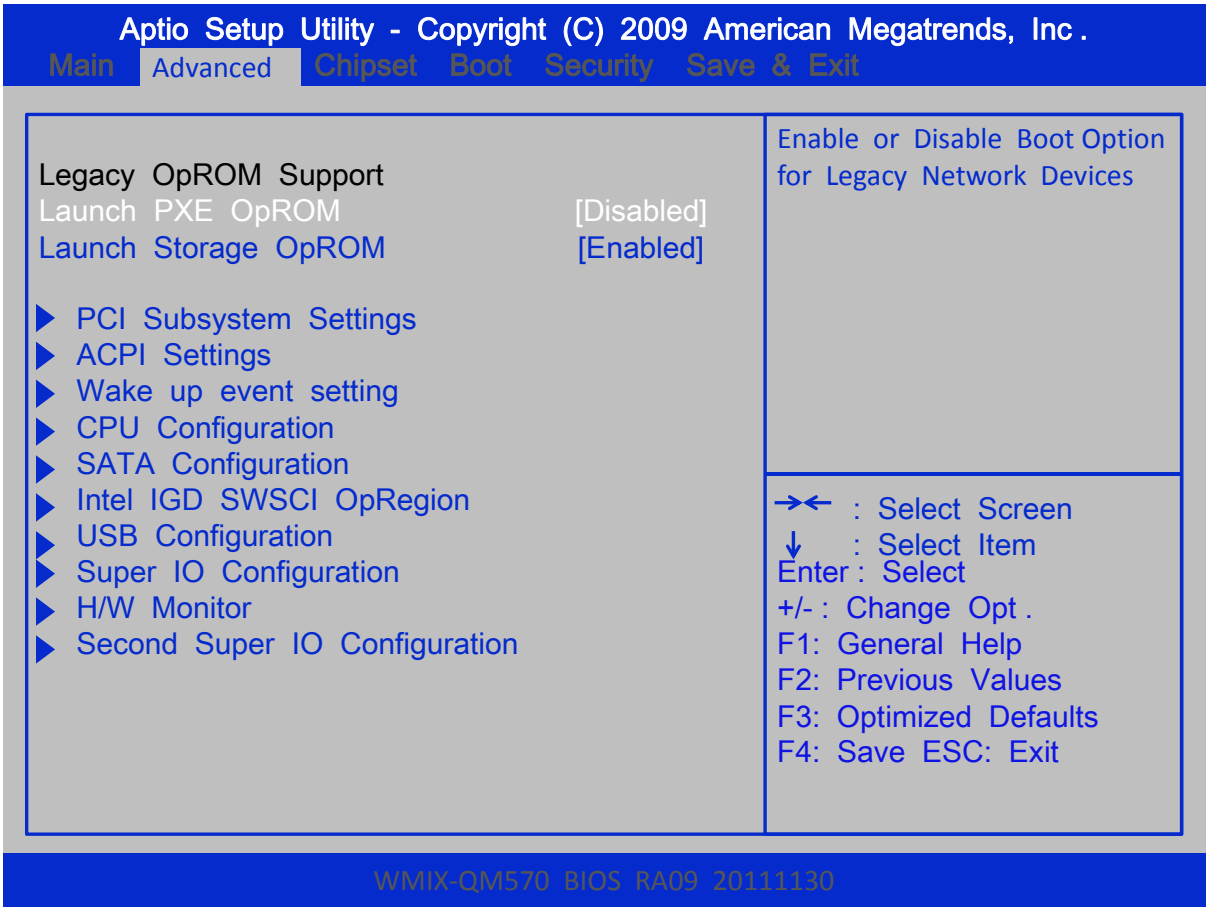
Set system date.

☐ **Time**

Set system time.

2.2 Advanced Menu

This section allows you to configure CPU and other system devices for basic operation through the following sub-menus.



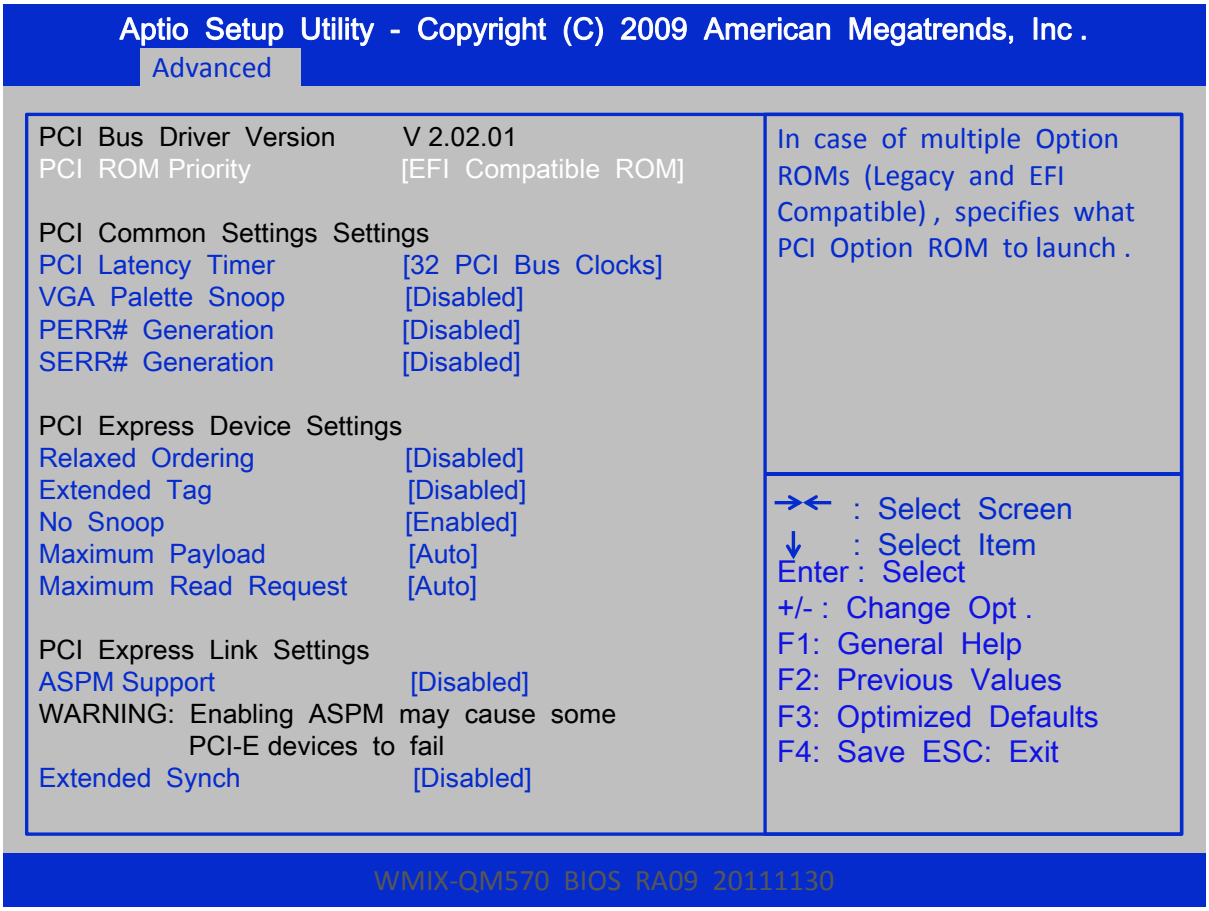
☐ **Launch PXE OpROM**

Disabled: Use this setting to ignore all PXE Option ROMs.

☐ **Launch Storage OpROM**

Enabled: Use this setting to specify that legacy PCI option ROMs for PCI storage devices are to be loaded and executed.

2.3 PCI Subsystem Setting


Aptio Setup Utility - Copyright (C) 2009 American Megatrends, Inc.
Advanced
PCI Bus Driver Version V 2.02.01
PCI ROM Priority [EFI Compatible ROM]
PCI Common Settings Settings
PCI Latency Timer [32 PCI Bus Clocks]
VGA Palette Snoop [Disabled]
PERR# Generation [Disabled]
SERR# Generation [Disabled]
PCI Express Device Settings
Relaxed Ordering [Disabled]
Extended Tag [Disabled]
No Snoop [Enabled]
Maximum Payload [Auto]
Maximum Read Request [Auto]
PCI Express Link Settings
ASPM Support [Disabled]
WARNING: Enabling ASPM may cause some PCI-E devices to fail
Extended Synch [Disabled]
In case of multiple Option ROMs (Legacy and EFI Compatible), specifies what PCI Option ROM to launch.
: Select Screen
: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
WMIX-QM570 BIOS RA09 20111130

☐ **PCI ROM Priority**

In case of multiple optional ROMs (Legacy and EFI Compatible), specifies what PCI option ROM to launch.

☐ **PCI Latency Timer**

Choices: 32 PCI, 64 PCI, 96 PCI, 128 PCI, 160 PCI, 192 PCI, 224 PCI, 248 PCI Bus Clocks.

☐ **VGA Palette Snoop**

Enable or Disable VGA palette registers snooping.

☐ **PERR# Generation**

If ENABLED allows generation of extended synchronization patterns.

☐ **SERR# Generation**

Enable or Disable PCI devices to generate SERR#.

☐ **Relaxed Ordering**

Enable or Disable PCI express device relaxed ordering.

☐ **Extended Tag**

If ENABLED allows devices to use 8-bit as a requester.

☐ **No Snoop**

Enable or Disable PCI express devices without snoop option.

☐ **Maximum Payload**

Set maximum payload of PCI express device or allow system BIOS to select the value.

☐ **Maximum Read Request**

Set maximum read request Size of PCI express device or allow system BIOS to select the value.

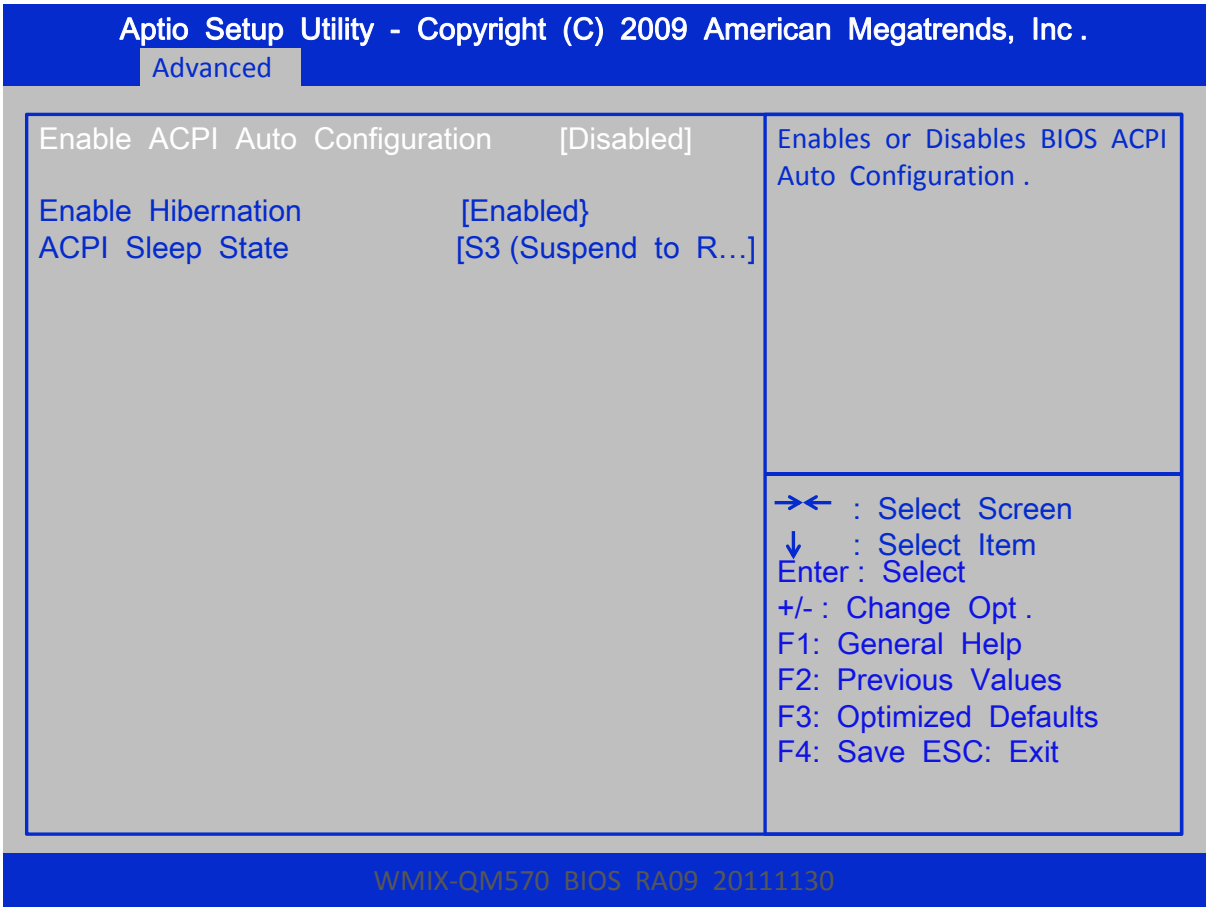
☐ **ASPM Support**

Set the ASPM Level

☐ **Extend Synch**

If ENABLED allows generation of extended synchronization patterns.

2.4 Advanced BIOS Feature Setup


Aptio Setup Utility - Copyright (C) 2009 American Megatrends, Inc.
Advanced
Enable ACPI Auto Configuration [Disabled]
Enable Hibernation [Enabled}
ACPI Sleep State [S3 (Suspend to R...]
Enables or Disables BIOS ACPI Auto Configuration.
: Select Screen
: Select Item
Enter : Select
+/- : Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
WMIX-QM570 BIOS RA09 20111130

☐ **Enable ACPI Auto Configuration**

Enable or Disable BIOS ACPI auto configuration.

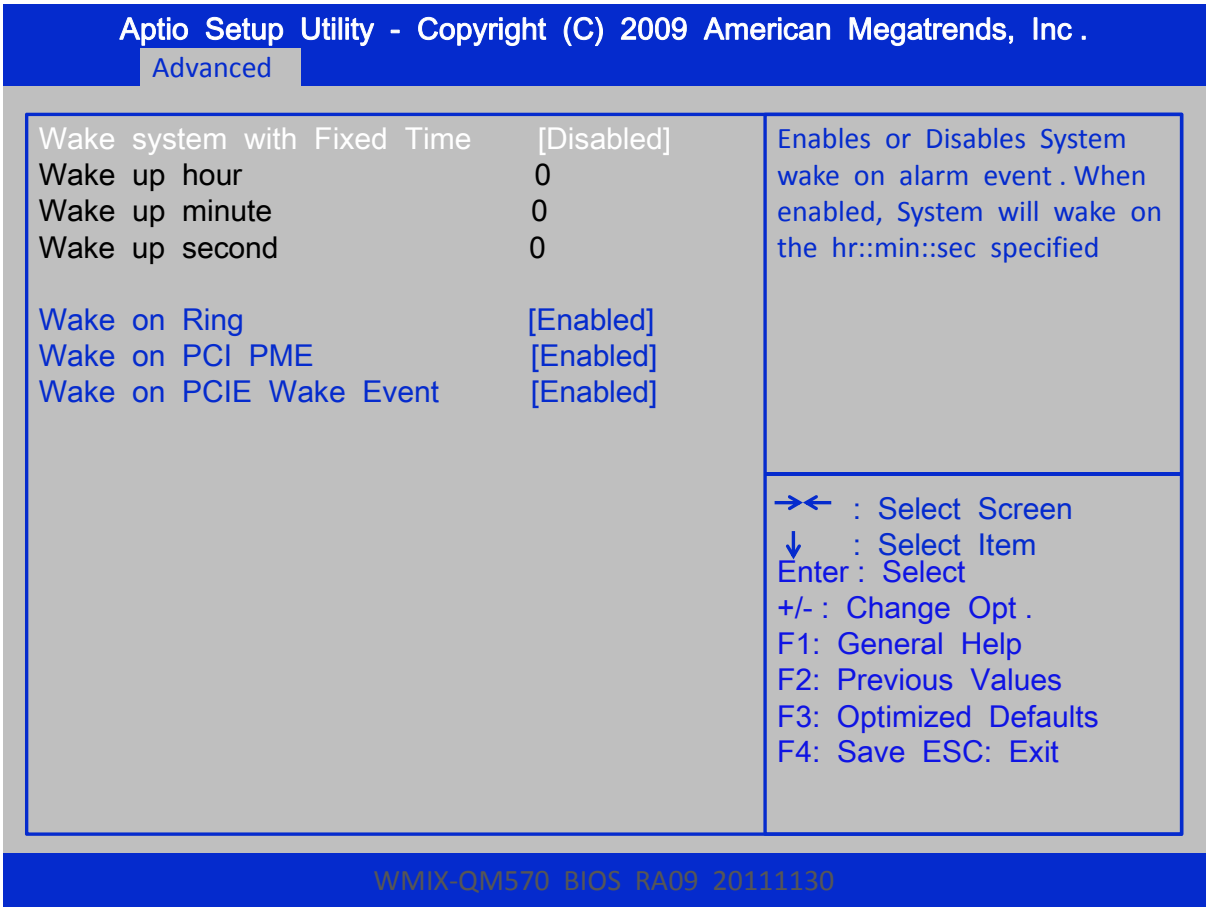
☐ **Enable Hibernation**

Enable or Disable system ability to hibernate (OS/S4 sleep state). This option may be not effective with some OS.

☐ **ACPI Sleep State**

Select the highest ACPI sleep state the system will enter, when SUSPEND button is pressed.

2.5 Wake system


Aptio Setup Utility - Copyright (C) 2009 American Megatrends, Inc.
Advanced
Wake system with Fixed Time [Disabled]
Wake up hour 0
Wake up minute 0
Wake up second 0
Wake on Ring [Enabled]
Wake on PCI PME [Enabled]
Wake on PCIE Wake Event [Enabled]
Enables or Disables System wake on alarm event. When enabled, System will wake on the hr::min::sec specified
: Select Screen
: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
WMIX-QM570 BIOS RA09 20111130

☐ **Wake system with Fixed Time**

Set date and time to power on system from soft-off state.

☐ **Wake on Ring**

Select Power on by Ring Indicator signal from Modem.

☐ **Wake on PCI PME**

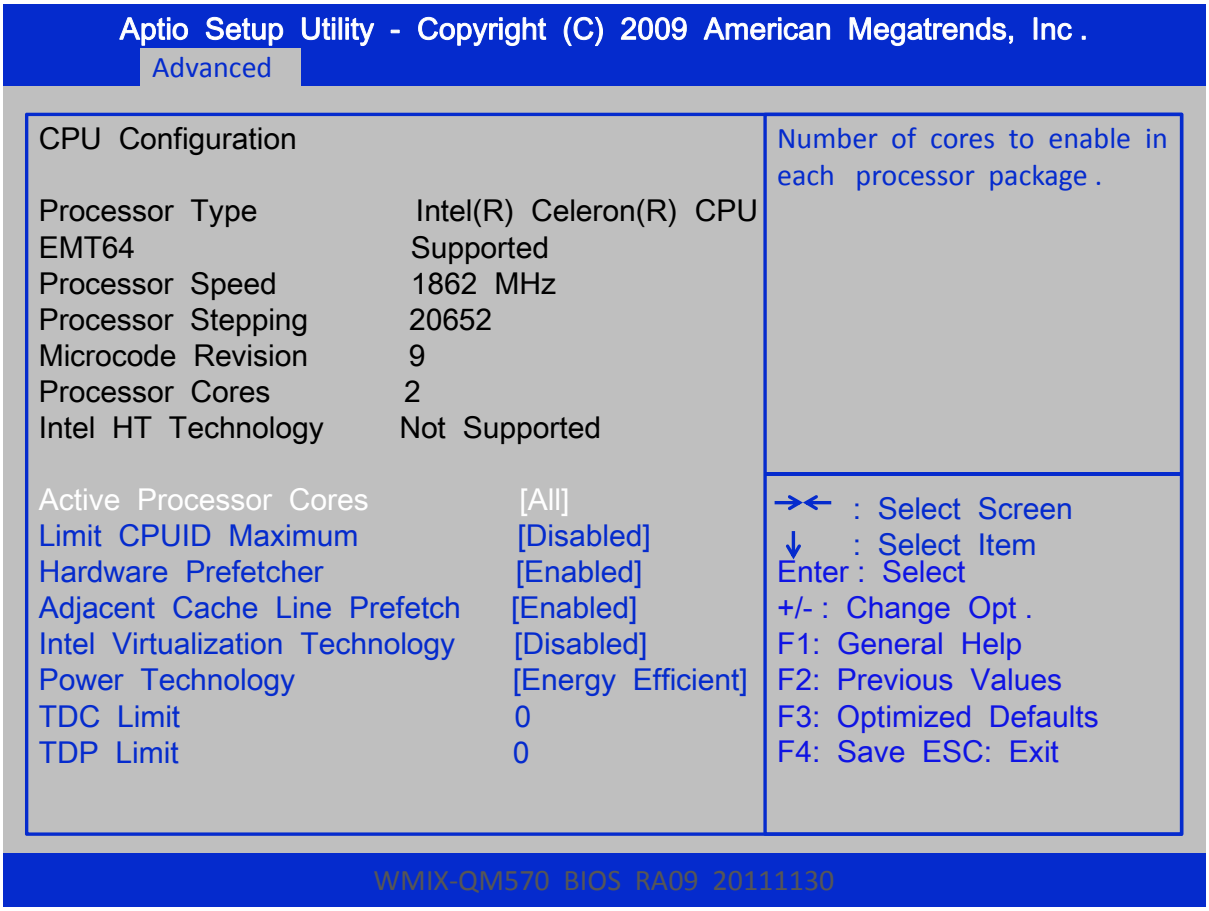
Select wake-up by PCI device.

Enabled/Disabled.

☐ **Wake on PCIE Wake Event**

Select wake-up by Lan Enabled/Disabled.

2.6 CPU Configuration



☐ **Limit CPUID Maximum**

Disabled for Windows XP

Choices: Disabled, Enabled.

☐ **Hardware Prefetcher**

For UP platforms, leave it enabled. For DP/MP servers, it may use to tune performance the specific application.

Choices: Disabled, Enabled.

☐ **Adjacent Cache Line Prefetech**

For UP platforms, leave it enabled. For DP/MP servers, it may use to tune performance the specific application.

Choices: Disabled, Enabled.

☐ **Intel Virtualization Technology**

Choices: Disabled, Enabled.

☐ **Power Technology**

Enable the power management features.

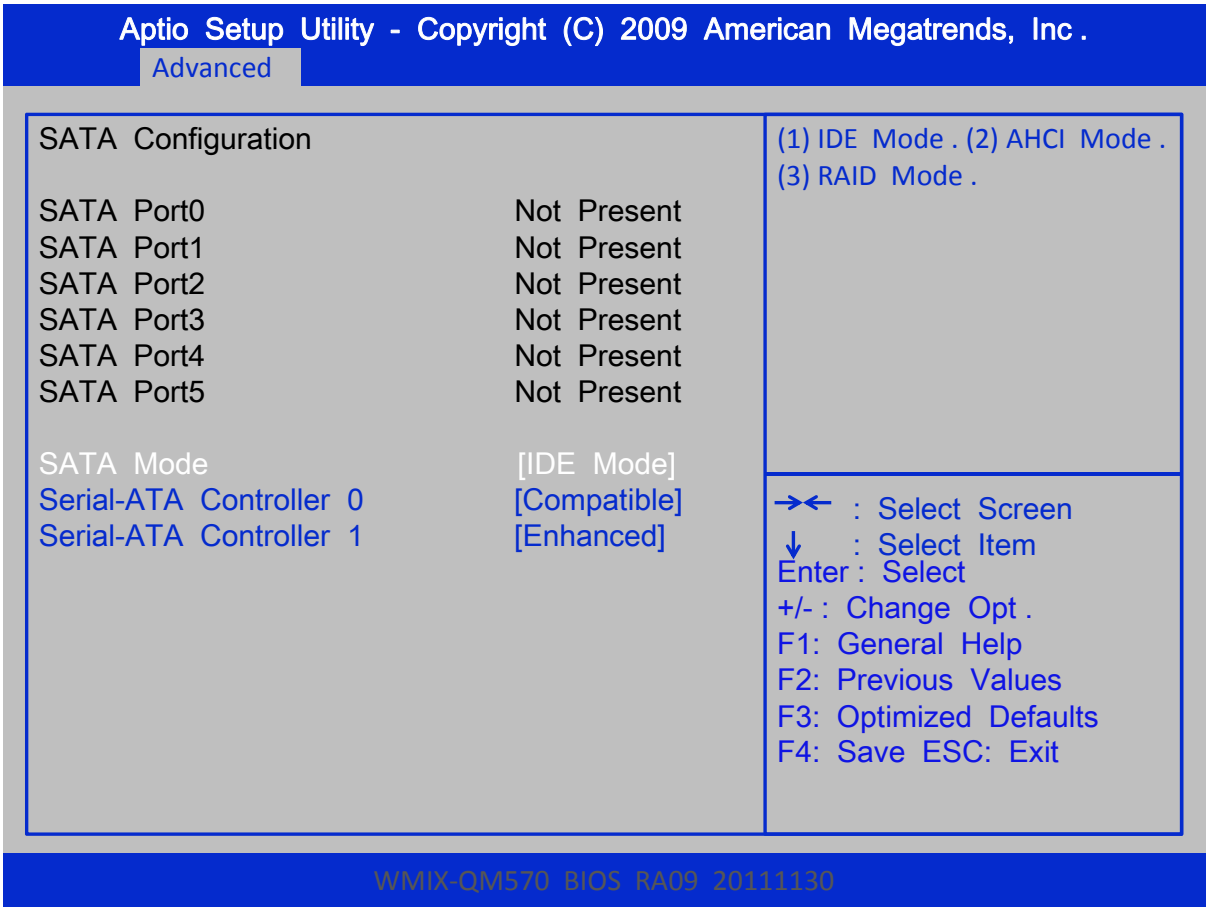
☐ **TDC Limit**

Turbo-XE mode processor TDC limits in 1/8 A granularity. 0 means using the factory-configured value.

☐ **TDP Limit**

Turbo-XE Mode Processor TDP Limits in 1/8 W granularity. 0 means using the factory-configured value.

2.7 SATA Configuration


Aptio Setup Utility - Copyright (C) 2009 American Megatrends, Inc.
Advanced
SATA Configuration
SATA Port0 Not Present
SATA Port1 Not Present
SATA Port2 Not Present
SATA Port3 Not Present
SATA Port4 Not Present
SATA Port5 Not Present
SATA Mode [IDE Mode]
Serial-ATA Controller 0 [Compatible]
Serial-ATA Controller 1 [Enhanced]
(1) IDE Mode . (2) AHCI Mode .
(3) RAID Mode .
: Select Screen
: Select Item
Enter : Select
+/- : Change Opt .
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
WMIX-QM570 BIOS RA09 20111130

☐ **SATA Mode**

This item allows you to select the operation mode for SATA controller.

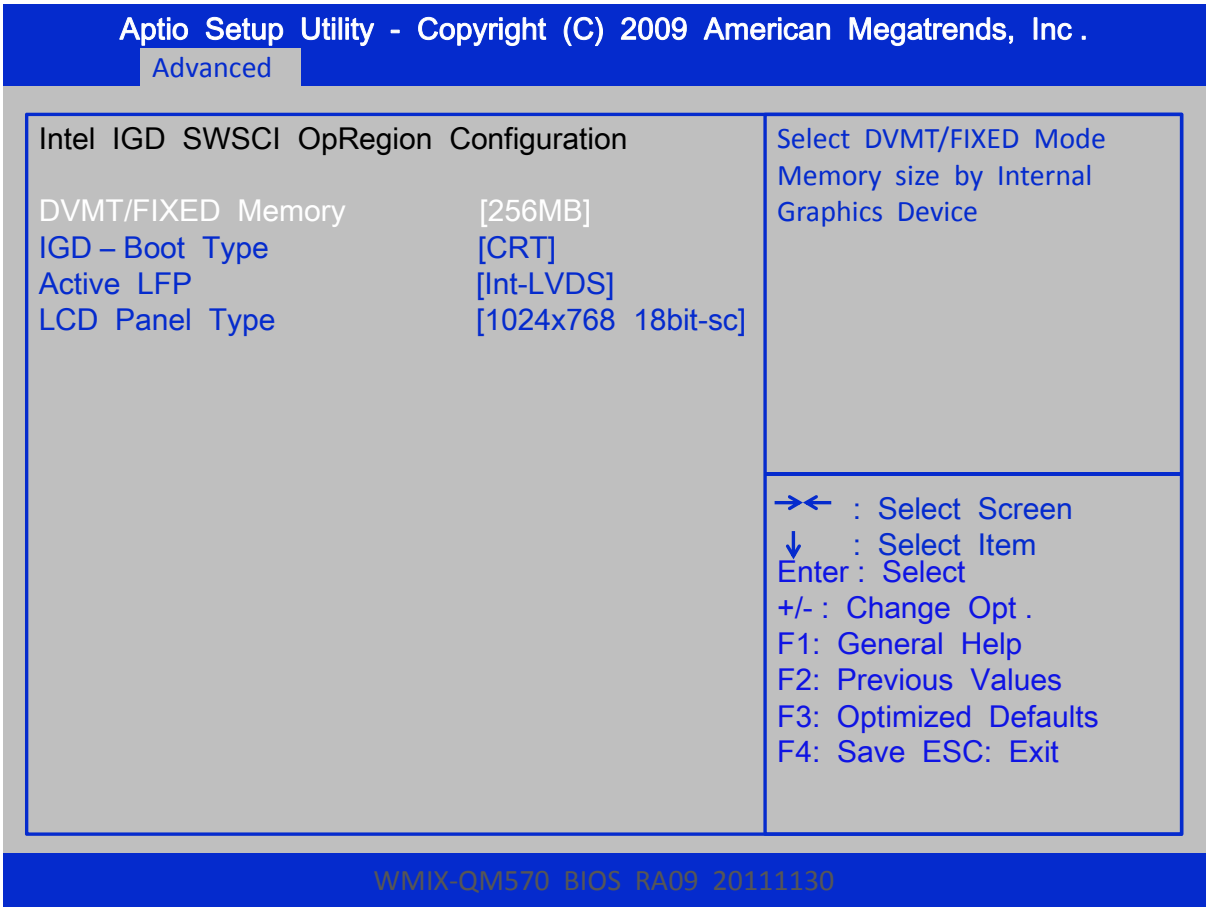
☐ **Serial-ATA Controller 0**

Enable/Disable serial ATA controller 0.

☐ **Serial-ATA Controller 1**

Enable/Disable serial ATA controller 0.

2.8 Intel IGD SWSCI OpRegion Configuration


Aptio Setup Utility - Copyright (C) 2009 American Megatrends, Inc.
Advanced
Intel IGD SWSCI OpRegion Configuration
DVMT/FIXED Memory [256MB]
IGD – Boot Type [CRT]
Active LFP [Int-LVDS]
LCD Panel Type [1024x768 18bit-sc]
Select DVMT/FIXED Mode Memory size by Internal Graphics Device
: Select Screen
: Select Item
Enter : Select
+/- : Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
WMIX-QM570 BIOS RA09 20111130

☐ **DVMT/FIXED Memory**

Choices: 128M, 256MB, maximum.

☐ **IGD-Boot Type**

This item allows you to select the display device when you boot up the system.

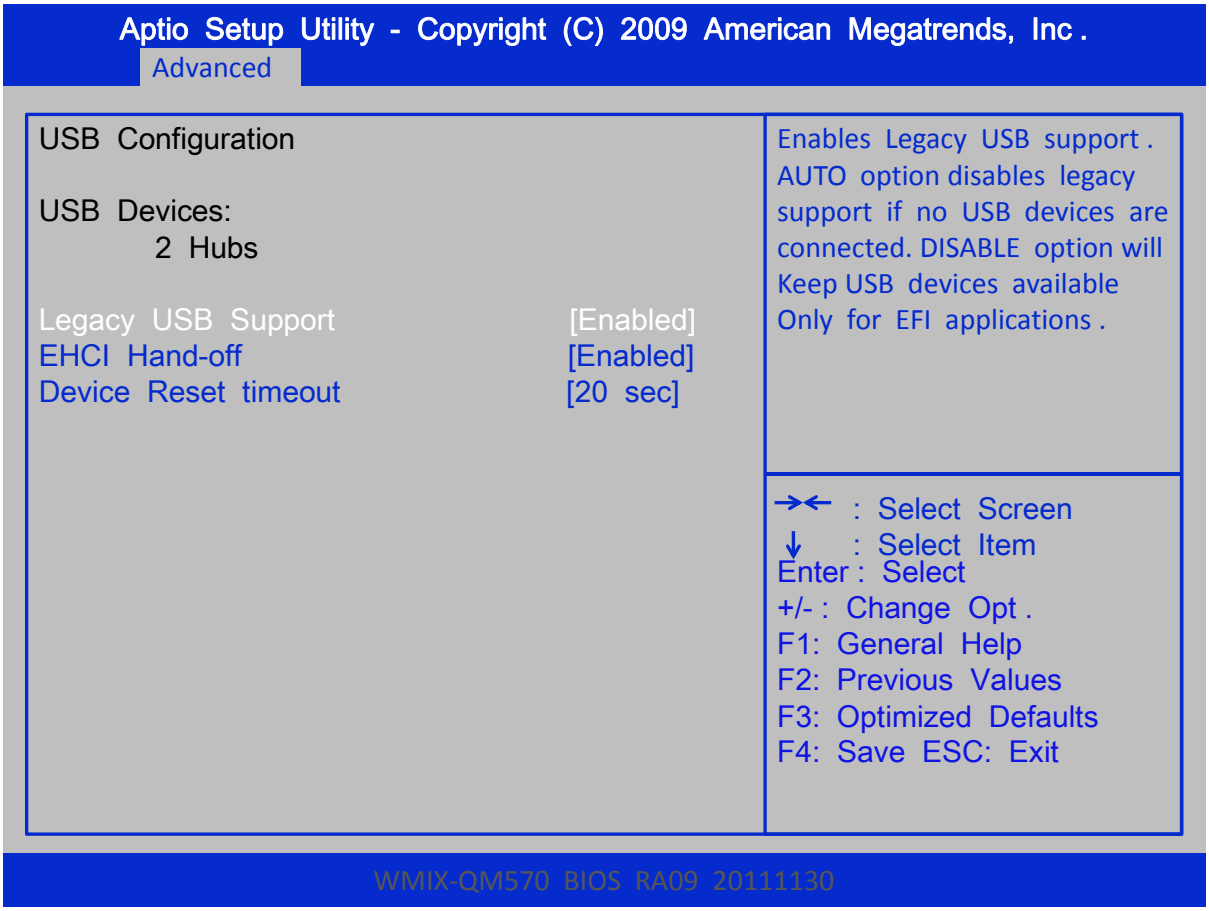
☐ **Active LFP**

VBIOS enables LVDS driver by Integrated encoder.

☐ **LCD Panel Type**

This item allows you to select panel resolution that will be displayed depending on the LCD panel.

2.9 USB Configuration


Aptio Setup Utility - Copyright (C) 2009 American Megatrends, Inc.
Advanced
USB Configuration
USB Devices:
2 Hubs
Legacy USB Support [Enabled]
EHCI Hand-off [Enabled]
Device Reset timeout [20 sec]
Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. DISABLE option will Keep USB devices available Only for EFI applications.
: Select Screen
: Select Item
Enter : Select
+/- : Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
WMIX-QM570 BIOS RA09 20111130

☐ **Legacy USB Support**

Set [Enabled] if you need to use any USB 1.1/2.0 devices in the operating system that does not support or have any USB 1.1/2.0 drivers installed. Such as DOS and SCO Unix.

☐ **EHCI Hand-off**

This is a workaround for OSs without EHCI hand-off support. The EHCI ownership change should be claimed by EHCI driver.

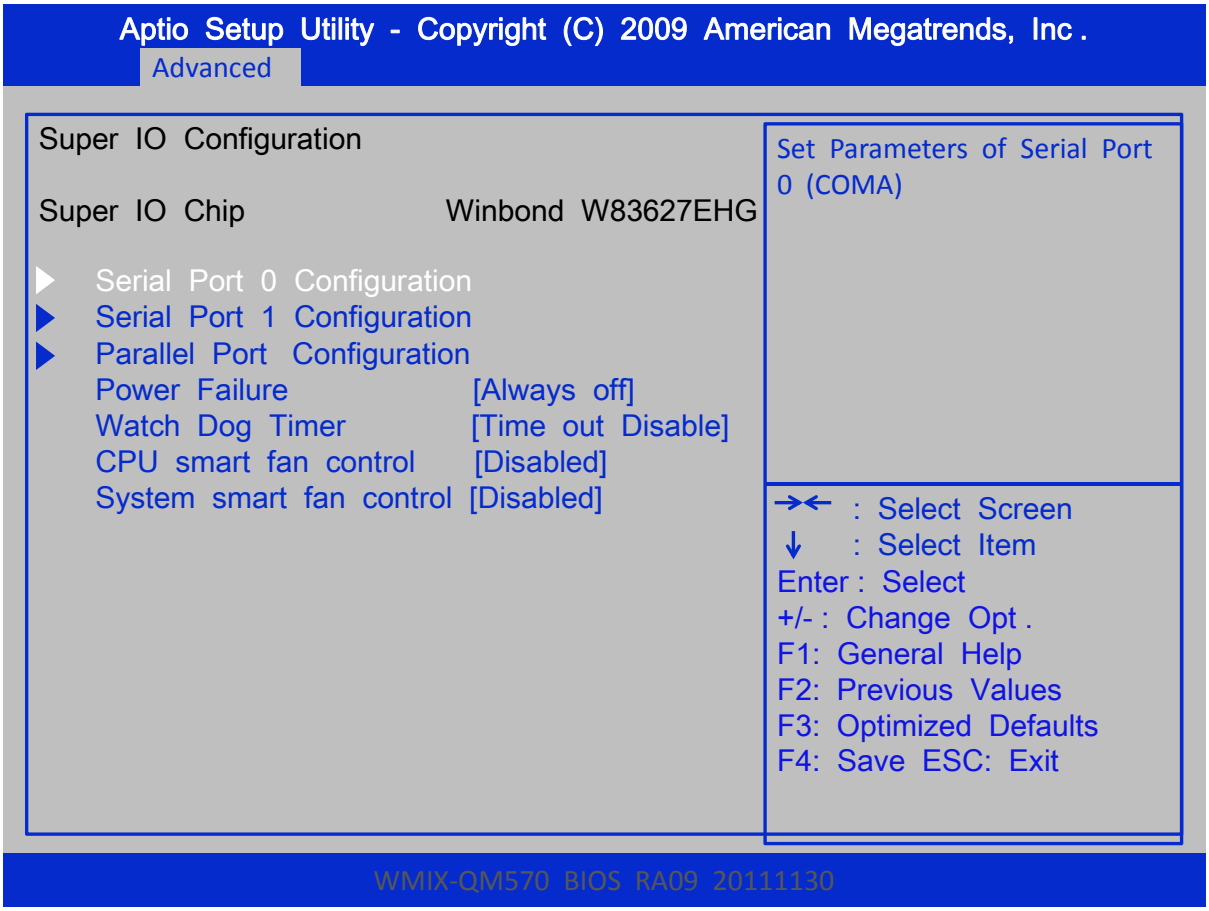
Choices: Enabled, Disabled

☐ **Device Reset timeout**

USB mass storage device starts unit command timeout.

Choices: 10, 20, 30, 40 sec.

2.10 Super IO Configuration


Aptio Setup Utility - Copyright (C) 2009 American Megatrends, Inc.
Advanced
Super IO Configuration
Super IO Chip Winbond W83627EHG
Serial Port 0 Configuration
Serial Port 1 Configuration
Parallel Port Configuration
Power Failure [Always off]
Watch Dog Timer [Time out Disable]
CPU smart fan control [Disabled]
System smart fan control [Disabled]
Set Parameters of Serial Port 0 (COMA)
: Select Screen
: Select Item
Enter : Select
+/- : Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
WMIX-QM570 BIOS RA09 20111130

☐ **Power Failure**

Always off.

☐ **Watch Dog Timer**

This option will determine watch dog timer.

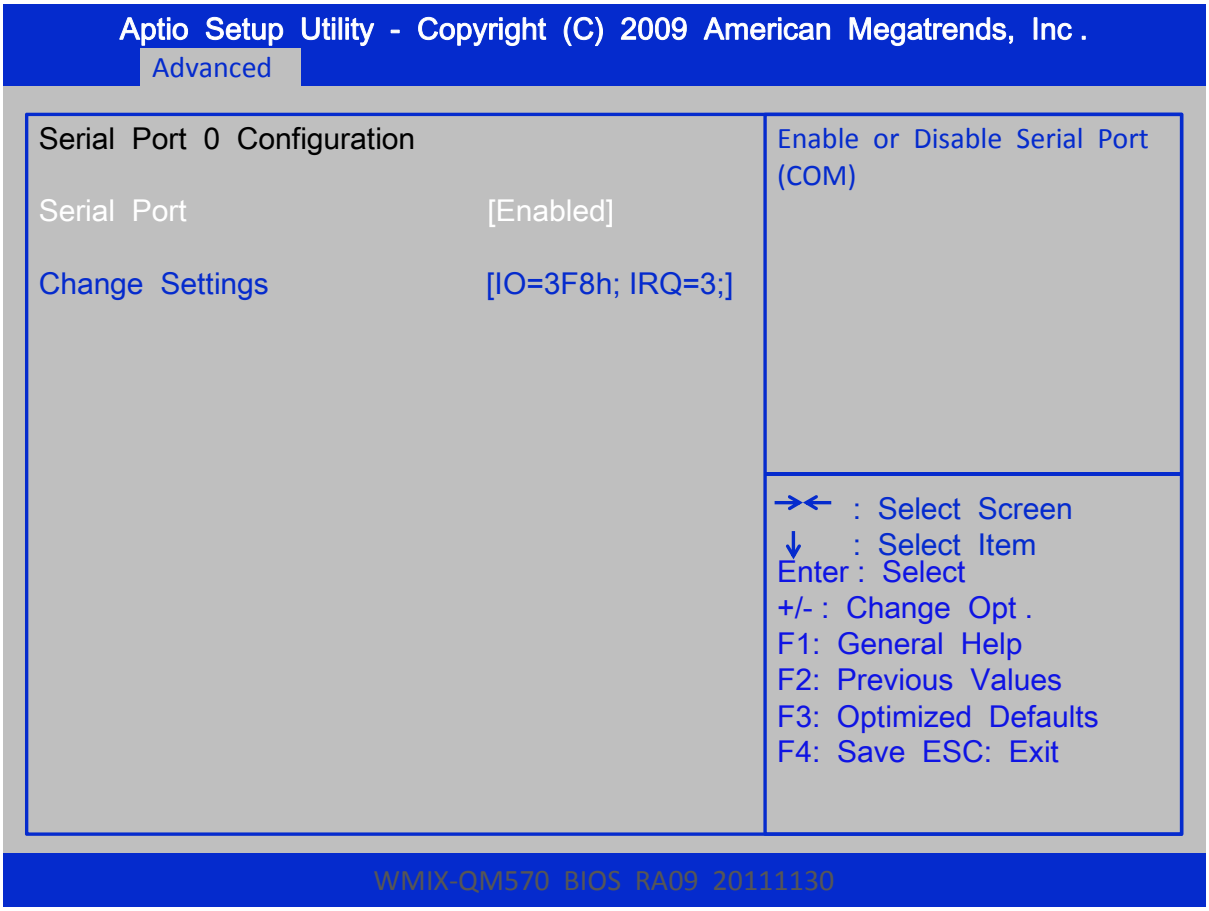
☐ **CPU smart fan control**

This option allows user to enable/disable the control of CPU fan speed by changing the fan voltage.

☐ **System smart fan control**

This option allows user to enable/disable the control of smart fan speed by changing the fan voltage.

2.11 Serial Port 0 Configuration


Aptio Setup Utility - Copyright (C) 2009 American Megatrends, Inc.
Advanced
Serial Port 0 Configuration
Serial Port [Enabled]
Change Settings [IO=3F8h; IRQ=3;]
Enable or Disable Serial Port (COM)
→← : Select Screen
↓ : Select Item
Enter : Select
+/- : Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
WMIX-QM570 BIOS RA09 20111130

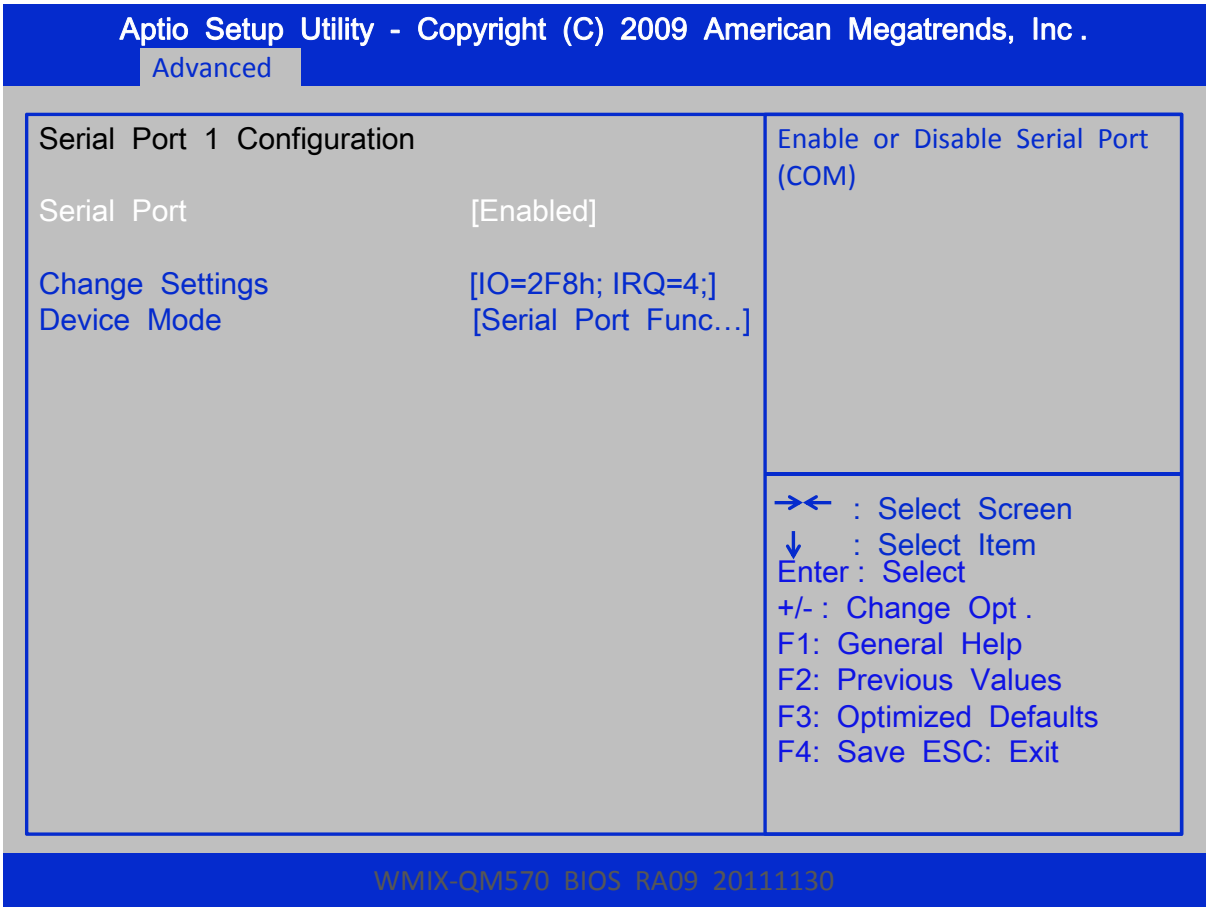
☐ **Serial Port**

Use this option to enable or disable the serial port.

☐ **Change Settings**

Use this option to change the serial port IO port address and interrupt address.

2.12 Serial Port 1 Configuration


Aptio Setup Utility - Copyright (C) 2009 American Megatrends, Inc.
Advanced
Serial Port 1 Configuration
Serial Port [Enabled]
Change Settings [IO=2F8h; IRQ=4;]
Device Mode [Serial Port Func...]
Enable or Disable Serial Port (COM)
→← : Select Screen
↓ : Select Item
Enter : Select
+/- : Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
WMIX-QM570 BIOS RA09 20111130

☐ **Serial Port**

Use this option to enable or disable the serial port.

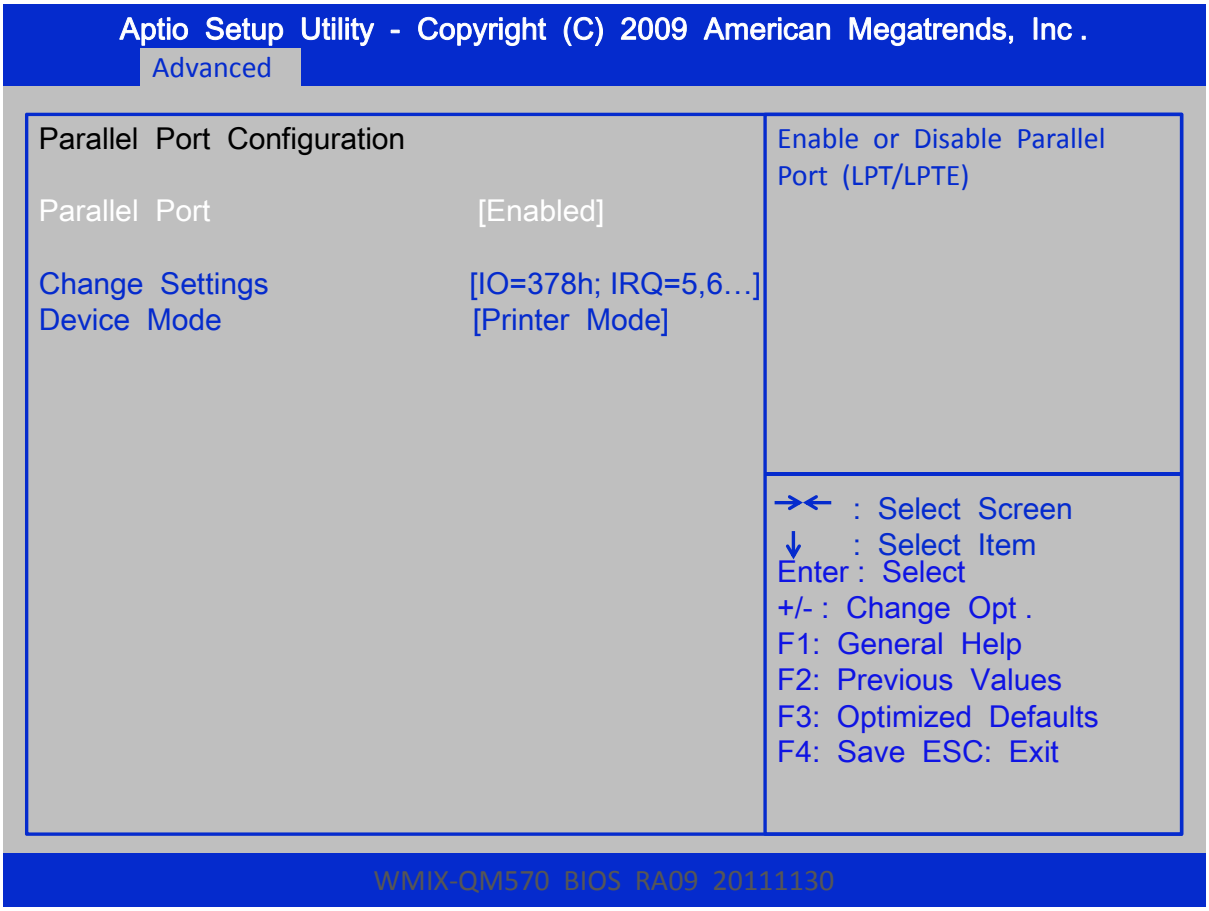
☐ **Change Settings**

Use this option to change the serial port IO port address and interrupt address.

☐ **Device Mode**

This item is serial port function.

2.13 Parallel Port Configuration



☐ **Parallel Port**

Use this option to enable or disable the parallel port.

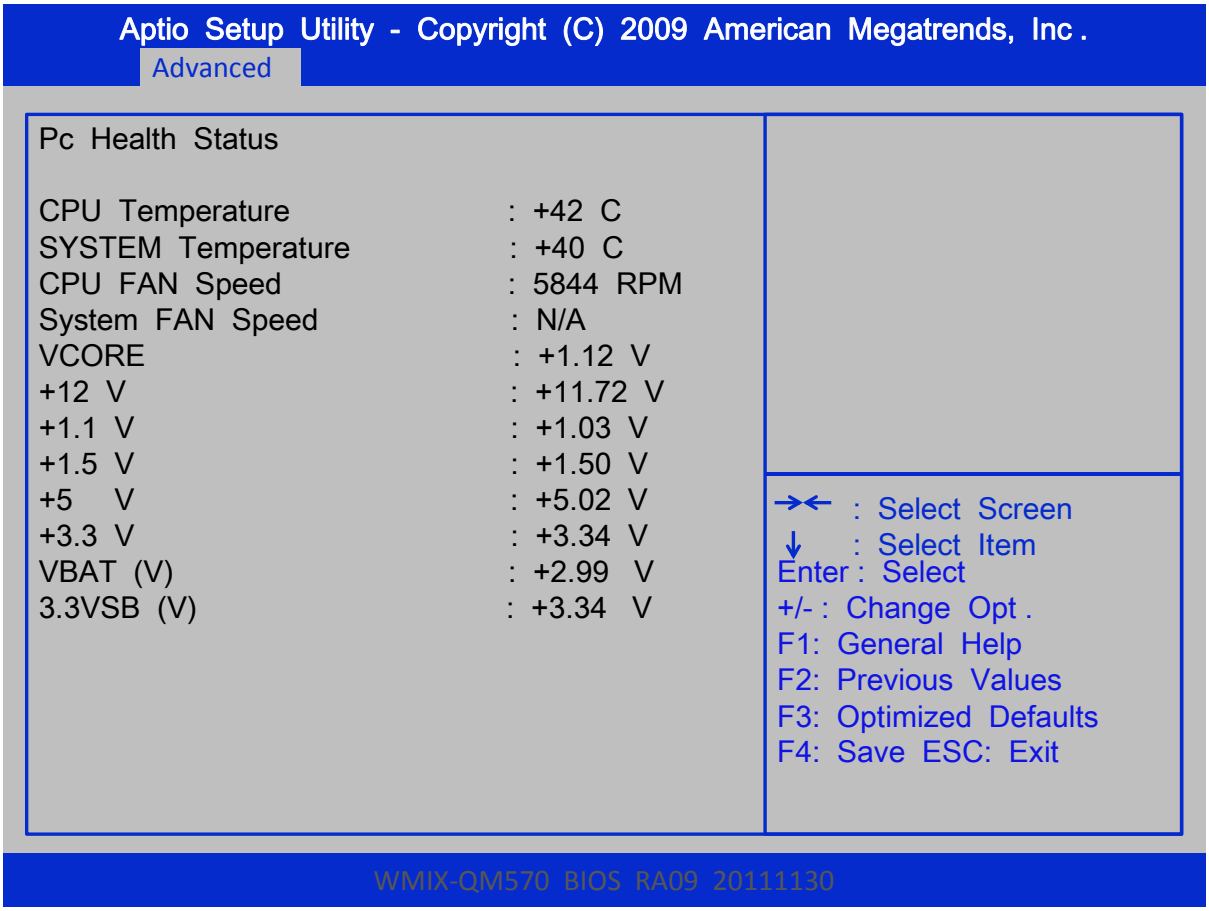
☐ **Change Settings**

Use this option to change the serial port IO port address and interrupt address.

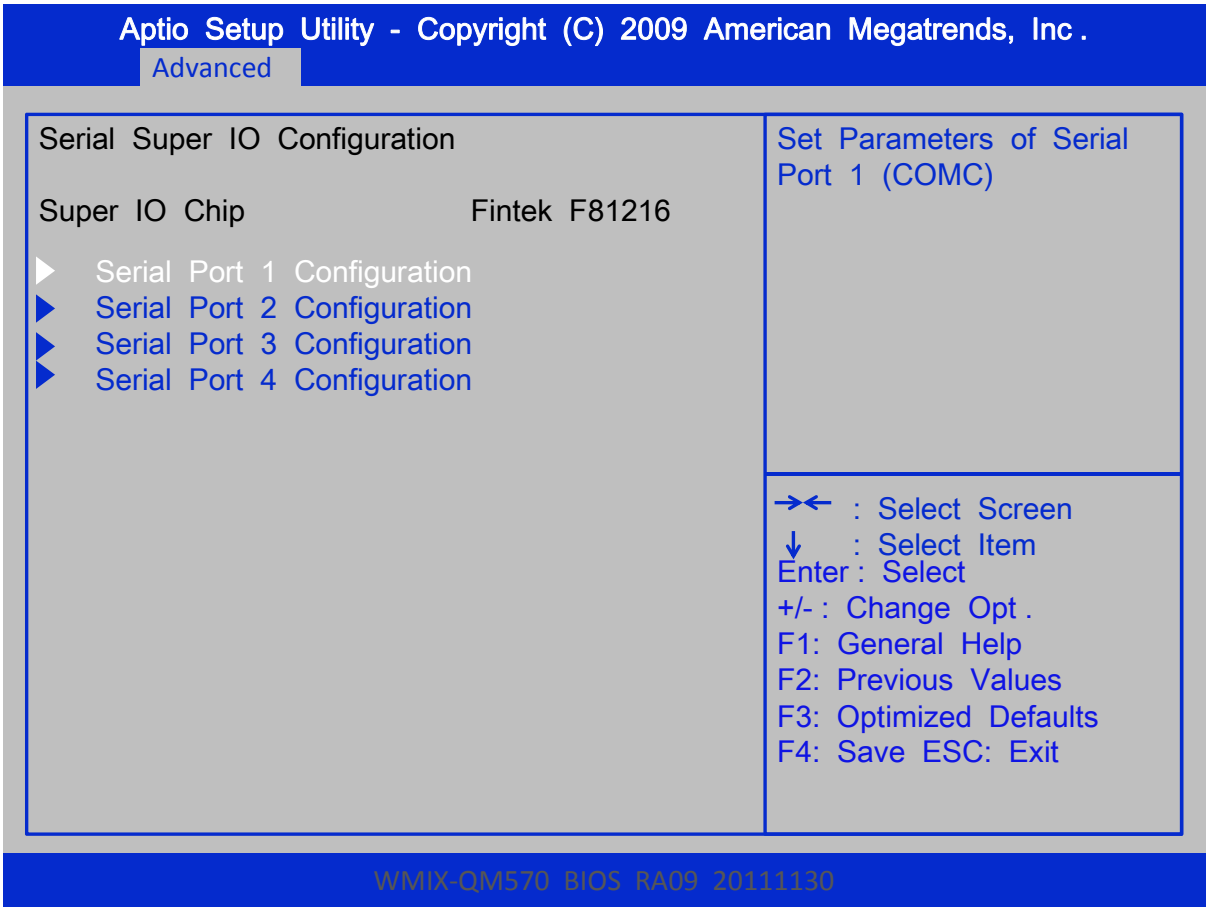
☐ **Device Mode**

Printer mode.

2.14 Pc Health Status


Aptio Setup Utility - Copyright (C) 2009 American Megatrends, Inc.
Advanced
Pc Health Status
CPU Temperature : +42 C
SYSTEM Temperature : +40 C
CPU FAN Speed : 5844 RPM
System FAN Speed : N/A
VCORE : +1.12 V
+12 V : +11.72 V
+1.1 V : +1.03 V
+1.5 V : +1.50 V
+5 V : +5.02 V
+3.3 V : +3.34 V
VBAT (V) : +2.99 V
3.3VSB (V) : +3.34 V
: Select Screen
: Select Item
Enter : Select
+/- : Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
WMIX-QM570 BIOS RA09 20111130

2.15 Serial Super IO Configuration


Aptio Setup Utility - Copyright (C) 2009 American Megatrends, Inc.
Advanced
Serial Super IO Configuration
Super IO Chip Fintek F81216
Serial Port 1 Configuration
Serial Port 2 Configuration
Serial Port 3 Configuration
Serial Port 4 Configuration
Set Parameters of Serial Port 1 (COMC)
: Select Screen
: Select Item
Enter : Select
+/- : Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
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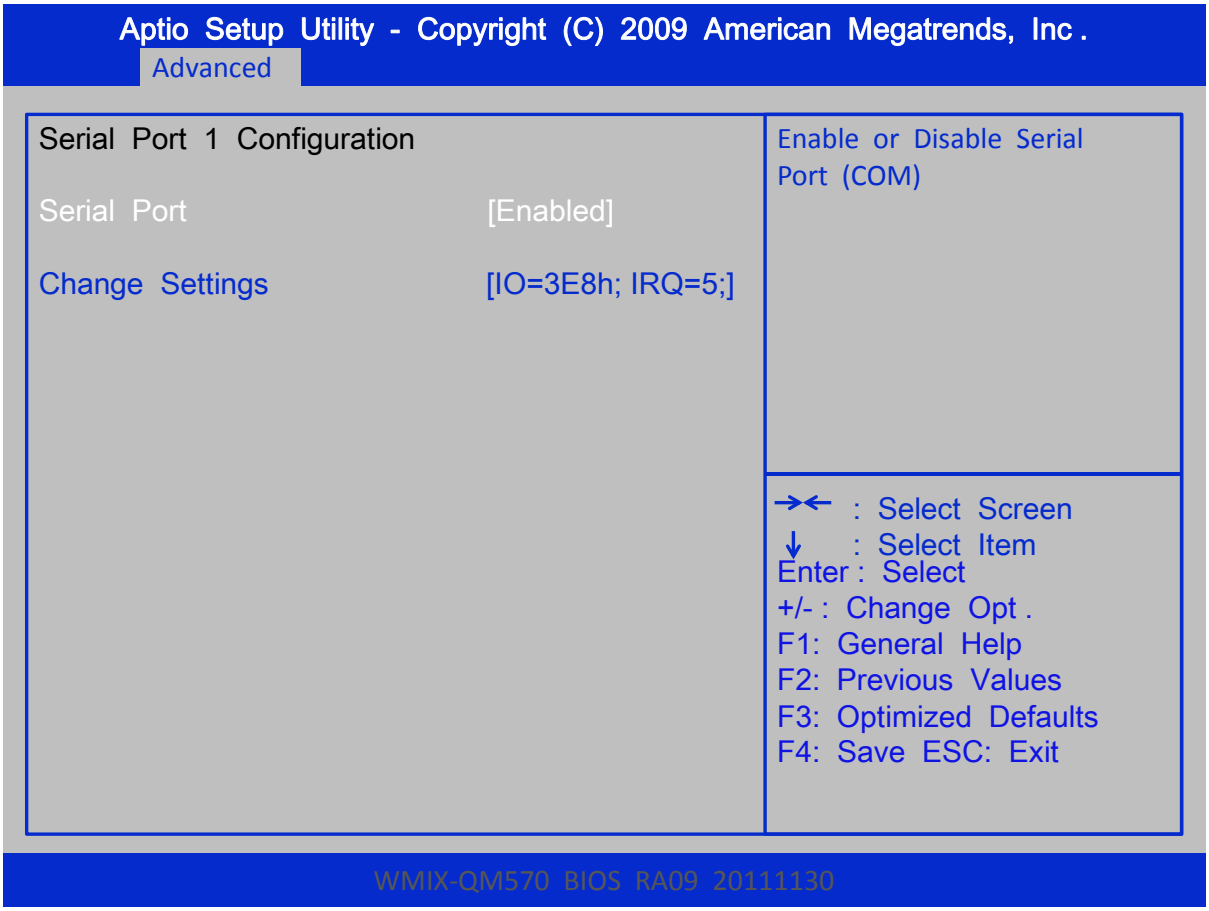
☐ **Serial Port 1 Configuration**

☐ **Serial Port 2 Configuration**

☐ **Serial Port 3 Configuration**

☐ **Serial Port 4 Configuration**

2.16 Serial Port Configuration



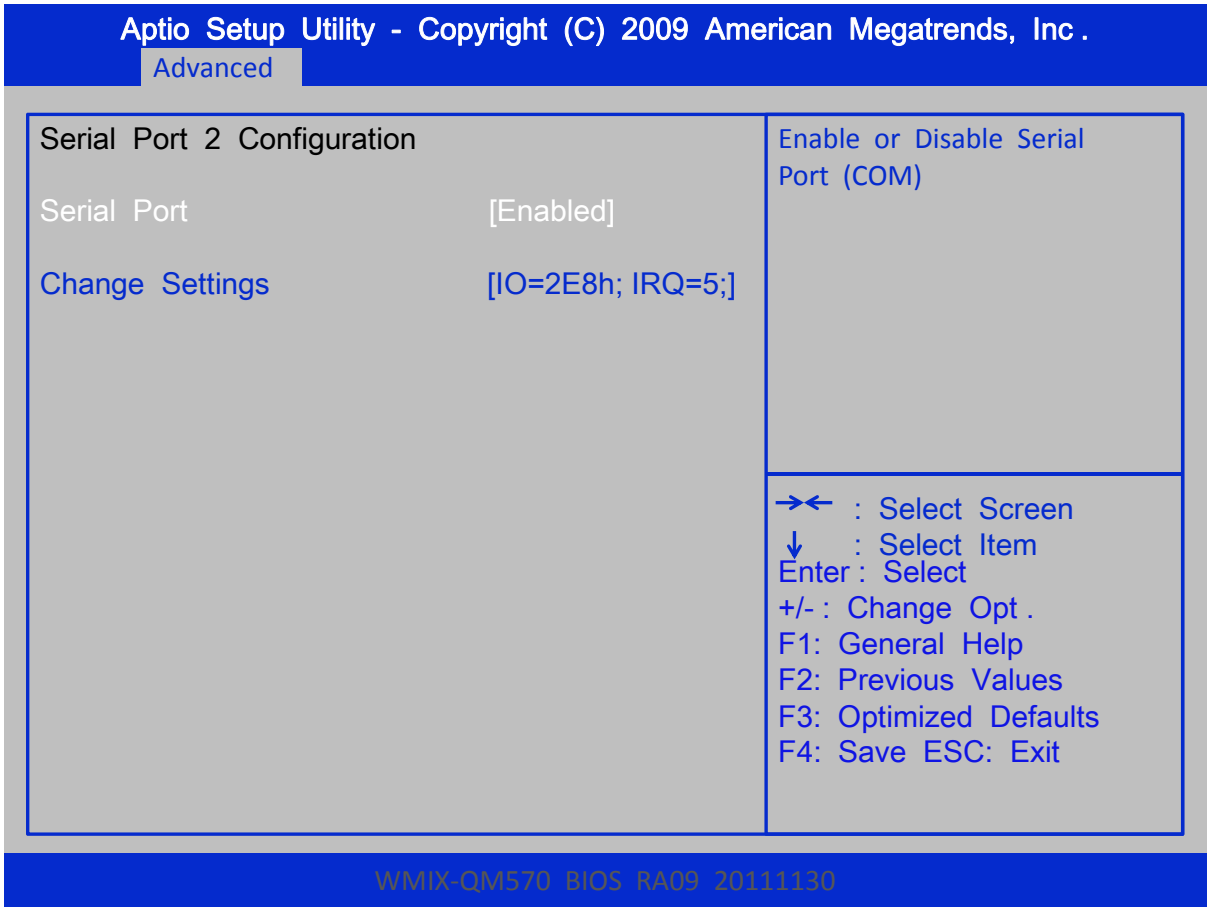
☐ Serial Port

Use this option to enable or disable the serial port.

☐ Change Settings

Use this option to change the serial port IO port address and interrupt address.

☐ Serial Port 2 Configuration


Aptio Setup Utility - Copyright (C) 2009 American Megatrends, Inc.
Advanced
Serial Port 2 Configuration
Serial Port [Enabled]
Change Settings [IO=2E8h; IRQ=5;]
Enable or Disable Serial Port (COM)
→← : Select Screen
↓ : Select Item
Enter : Select
+/- : Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
WMIX-QM570 BIOS RA09 20111130

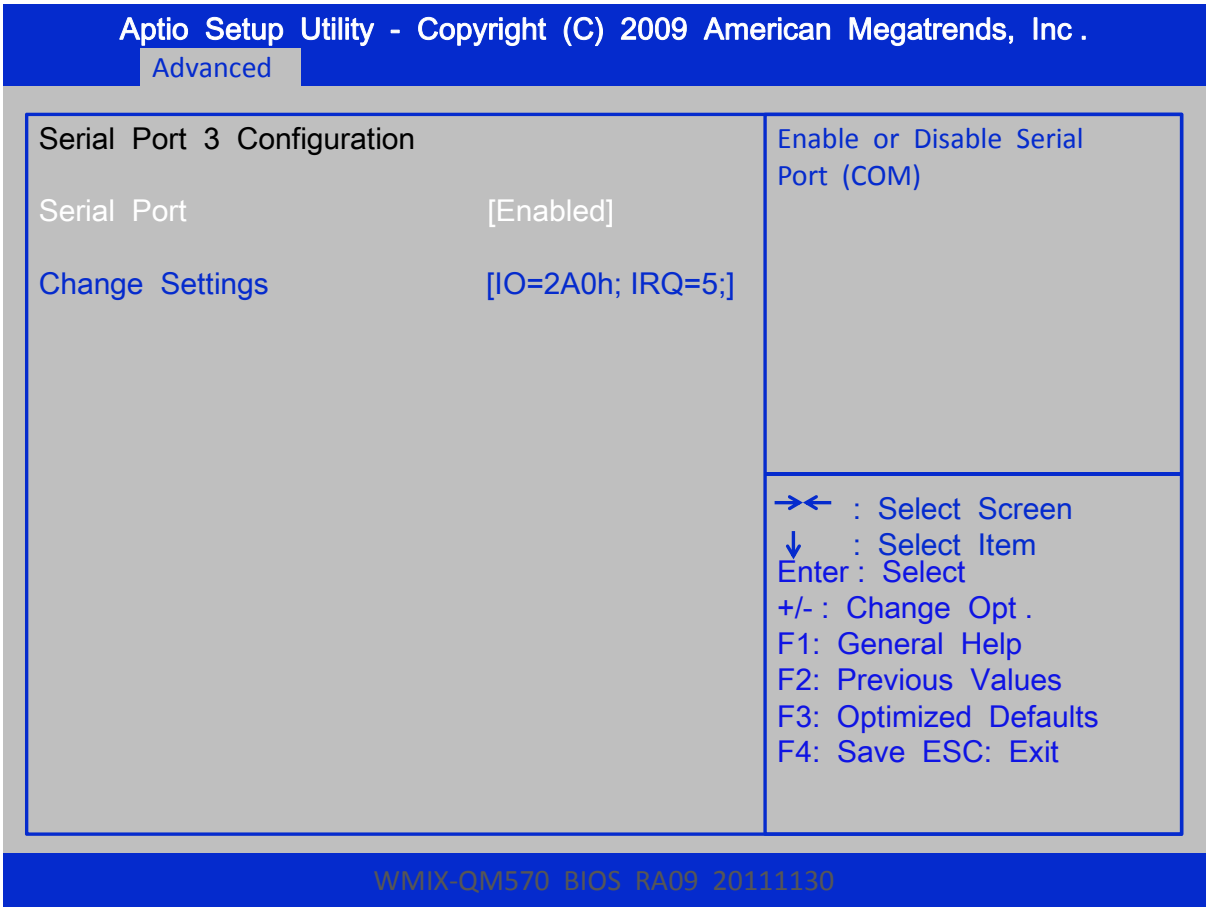
☐ Serial Port

Use this option to enable or disable the serial port.

☐ Change Settings

Use this option to change the serial port IO port address and interrupt address.

☐ Serial Port 3 Configuration


Aptio Setup Utility - Copyright (C) 2009 American Megatrends, Inc.
Advanced
Serial Port 3 Configuration
Serial Port [Enabled]
Change Settings [IO=2A0h; IRQ=5;]
Enable or Disable Serial Port (COM)
→← : Select Screen
↓ : Select Item
Enter : Select
+/- : Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
WMIX-QM570 BIOS RA09 20111130

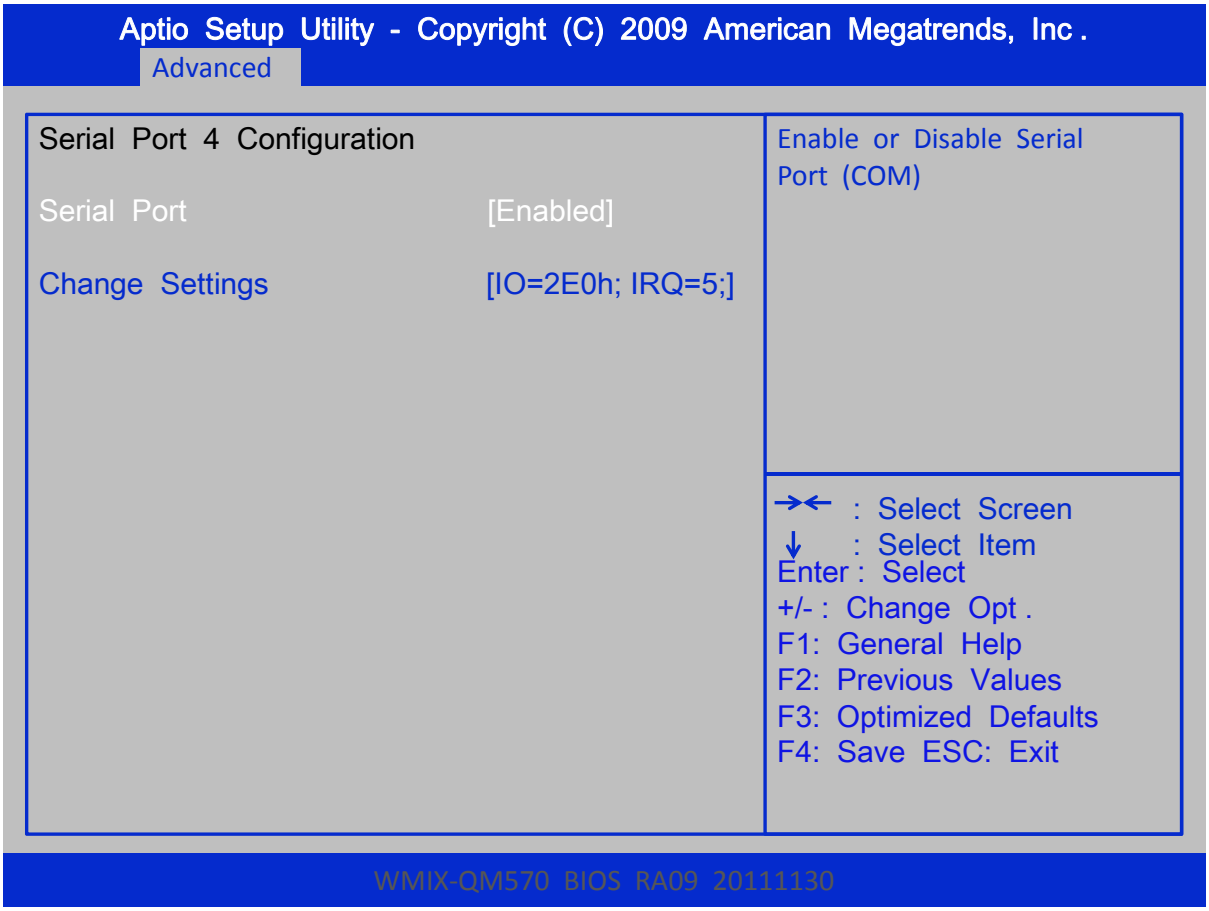
☐ Serial Port

Use this option to enable or disable the serial port.

☐ Change Settings

Use this option to change the serial port IO port address and interrupt address.

☐ Serial Port 4 Configuration


Aptio Setup Utility - Copyright (C) 2009 American Megatrends, Inc.
Advanced
Serial Port 4 Configuration
Serial Port [Enabled]
Change Settings [IO=2E0h; IRQ=5;]
Enable or Disable Serial Port (COM)
→← : Select Screen
↓ : Select Item
Enter : Select
+/- : Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
WMIX-QM570 BIOS RA09 20111130

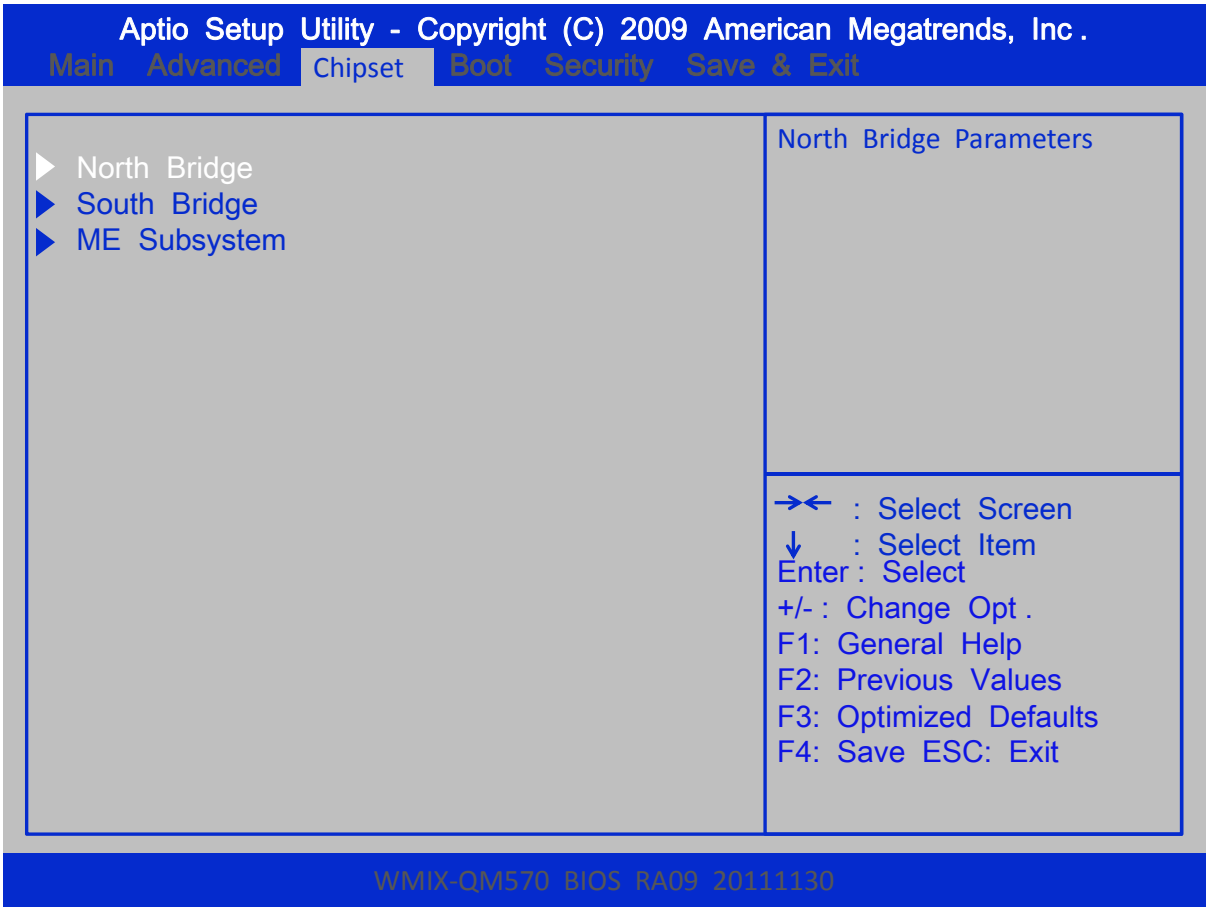
☐ Serial Port

Use this option to enable or disable the serial port.

☐ Change Settings

Use this option to change the serial port IO port address and interrupt address.

2.17 Chipset

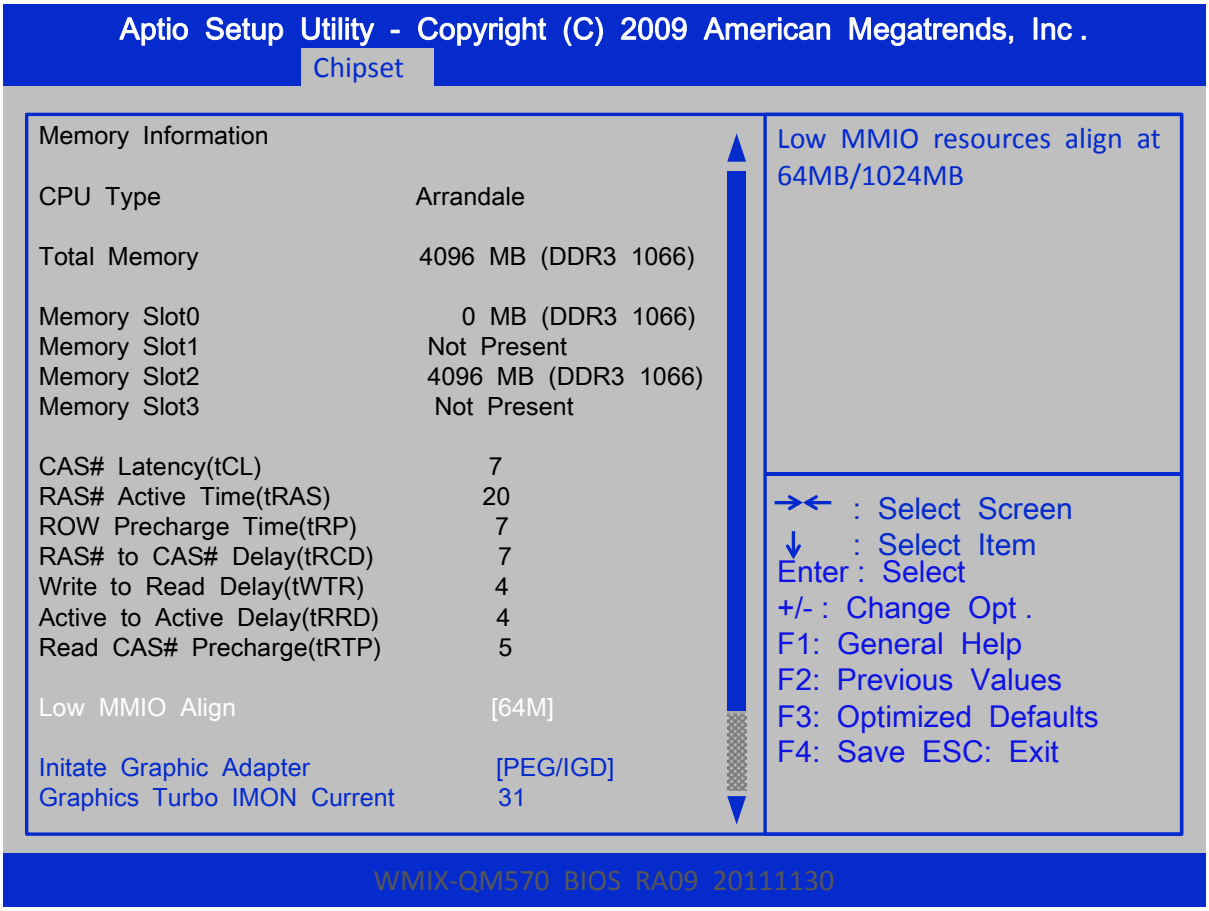


☐ **North Bridge**

☐ **South Bridge**

☐ **ME Subsystem**

2.18 Memory Information


Aptio Setup Utility - Copyright (C) 2009 American Megatrends, Inc.
Chipset
Memory Information
CPU Type Arrandale
Total Memory 4096 MB (DDR3 1066)
Memory Slot0 0 MB (DDR3 1066)
Memory Slot1 Not Present
Memory Slot2 4096 MB (DDR3 1066)
Memory Slot3 Not Present
CAS# Latency(tCL) 7
RAS# Active Time(tRAS) 20
ROW Precharge Time(tRP) 7
RAS# to CAS# Delay(tRCD) 7
Write to Read Delay(tWTR) 4
Active to Active Delay(tRRD) 4
Read CAS# Precharge(tRTP) 5
Low MMIO Align [64M]
Initate Graphic Adapter [PEG/IGD]
Graphics Turbo IMON Current 31
Low MMIO resources align at 64MB/1024MB
: Select Screen
: Select Item
Enter : Select
+/- : Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
WMIX-QM570 BIOS RA09 20111130

☐ Low MMIO Align

This option will determine Low MMIO resources align.

☐ Initate Graphic Adapter

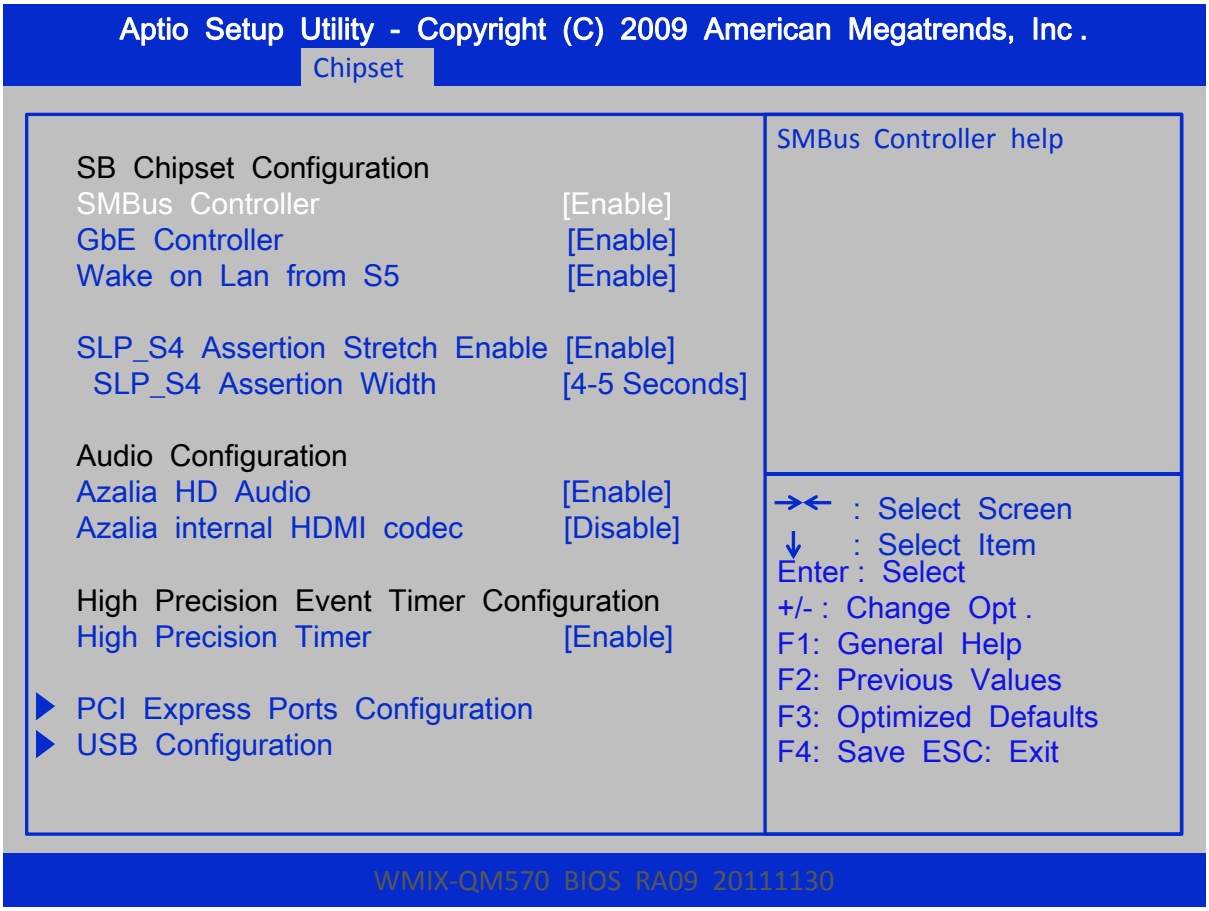
Select which graphics controller to use as the primary boot device.

Choices: IGD, PCI/IGD, PCI/PEG, PEG/IGD, PEG/PCI.

☐ Graphics Turbo IMON Current

Graphics Turbo IMON Current values supported.

2.19 SB Chipset Configuration



☐ **GbE Controller**

SMBus Controller help.

☐ **Wake on Lan from S5**

Wake on Lan from S5 help.

☐ **SLP_S4 Assertion Stretch Enable**

Select a minimum assertion width of the SLP_S4# signal.

☐ **SLP_S4 Assertion Width**

Choices: 1-2, 2-3, 3-4, 4-5 seconds

☐ **Azalia HD Audio**

Use the Azalia HD audio option to enable or disable the high definition audio controller.

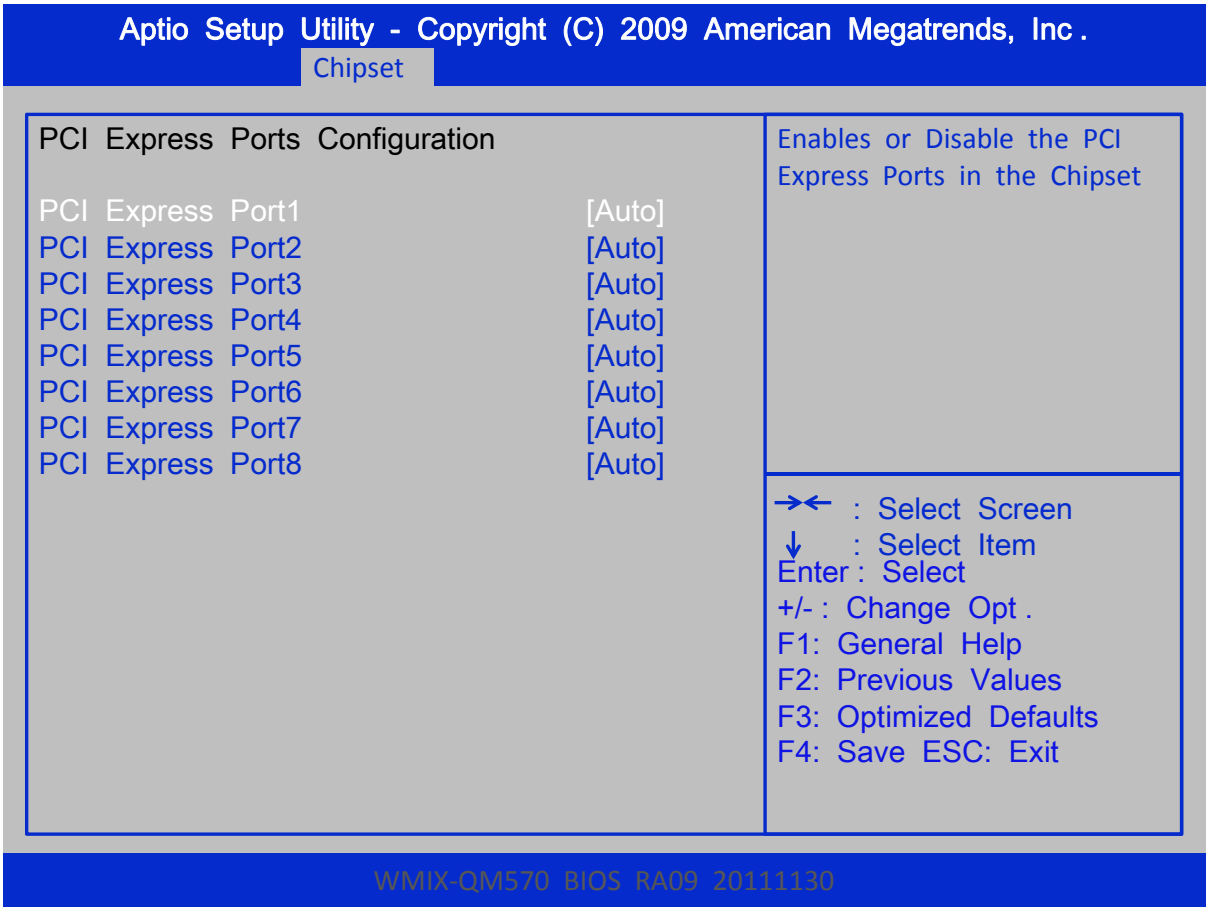
☐ **Azalia internal HDMI codec**

Use this item to enable or disable internal HDMI codec for Azalia.

☐ **High Precision Timer**

This item helps to enable or disable high precision timer.

2.20 PCI Express Ports Configuration


Aptio Setup Utility - Copyright (C) 2009 American Megatrends, Inc.
Chipset
PCI Express Ports Configuration
PCI Express Port1 [Auto]
PCI Express Port2 [Auto]
PCI Express Port3 [Auto]
PCI Express Port4 [Auto]
PCI Express Port5 [Auto]
PCI Express Port6 [Auto]
PCI Express Port7 [Auto]
PCI Express Port8 [Auto]
Enables or Disable the PCI Express Ports in the Chipset
: Select Screen
: Select Item
Enter : Select
+/- : Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
WMIX-QM570 BIOS RA09 20111130

☐ **PCI Express Port1**

☐ **PCI Express Port2**

☐ **PCI Express Port3**

☐ **PCI Express Port4**

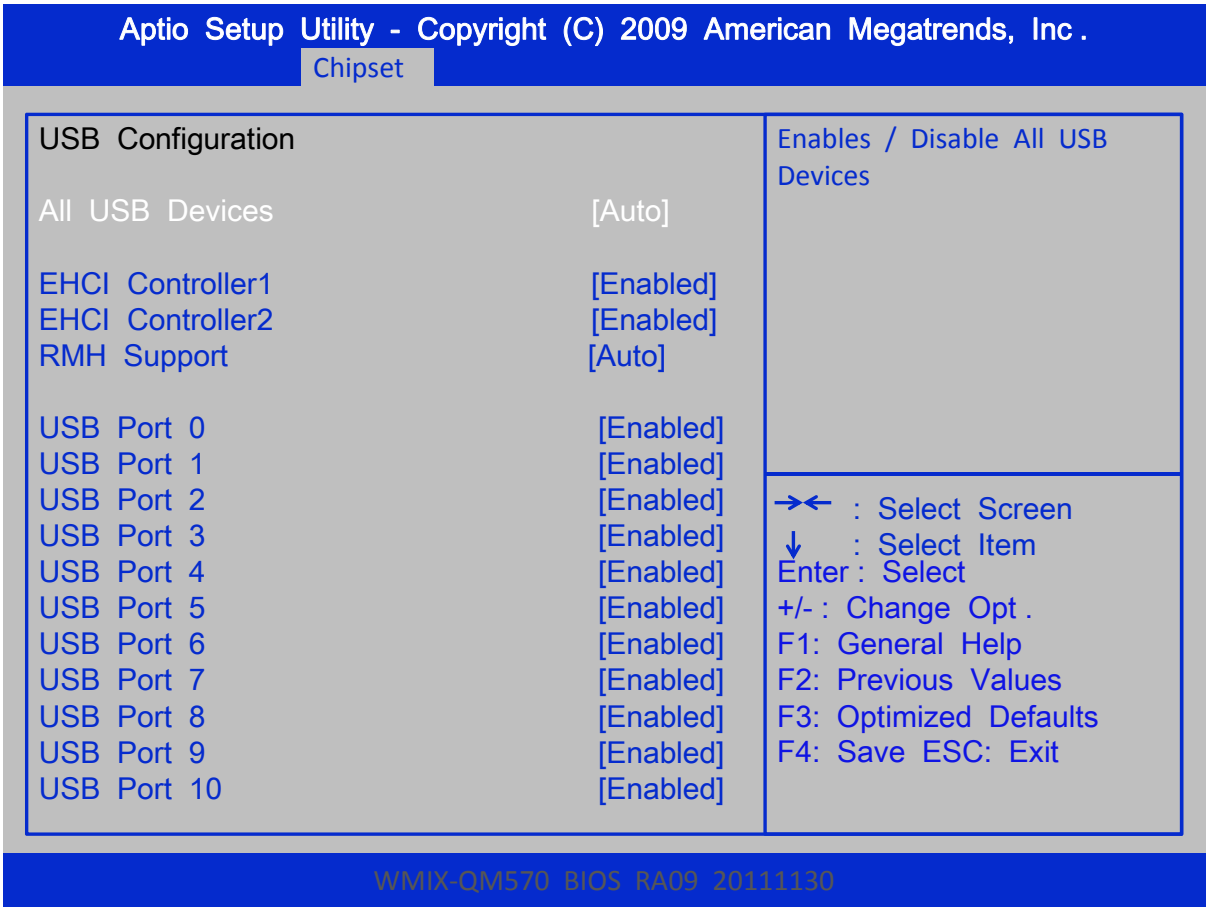
☐ **PCI Express Port5**

☐ **PCI Express Port6**

☐ **PCI Express Port7**

☐ **PCI Express Port8**

2.21 USB Configuration



☐ **EHCI Controller1**

Choices: Disabled, Enabled

☐ **EHCI Controller2**

Choices: Disabled, Enabled

☐ **RMH Support**

☐ **USB Port0**

☐ **USB Port1**

☐ **USB Port2**

☐ **USB Port3**

☐ **USB Port4**

☐ **USB Port5**

☐ **USB Port6**

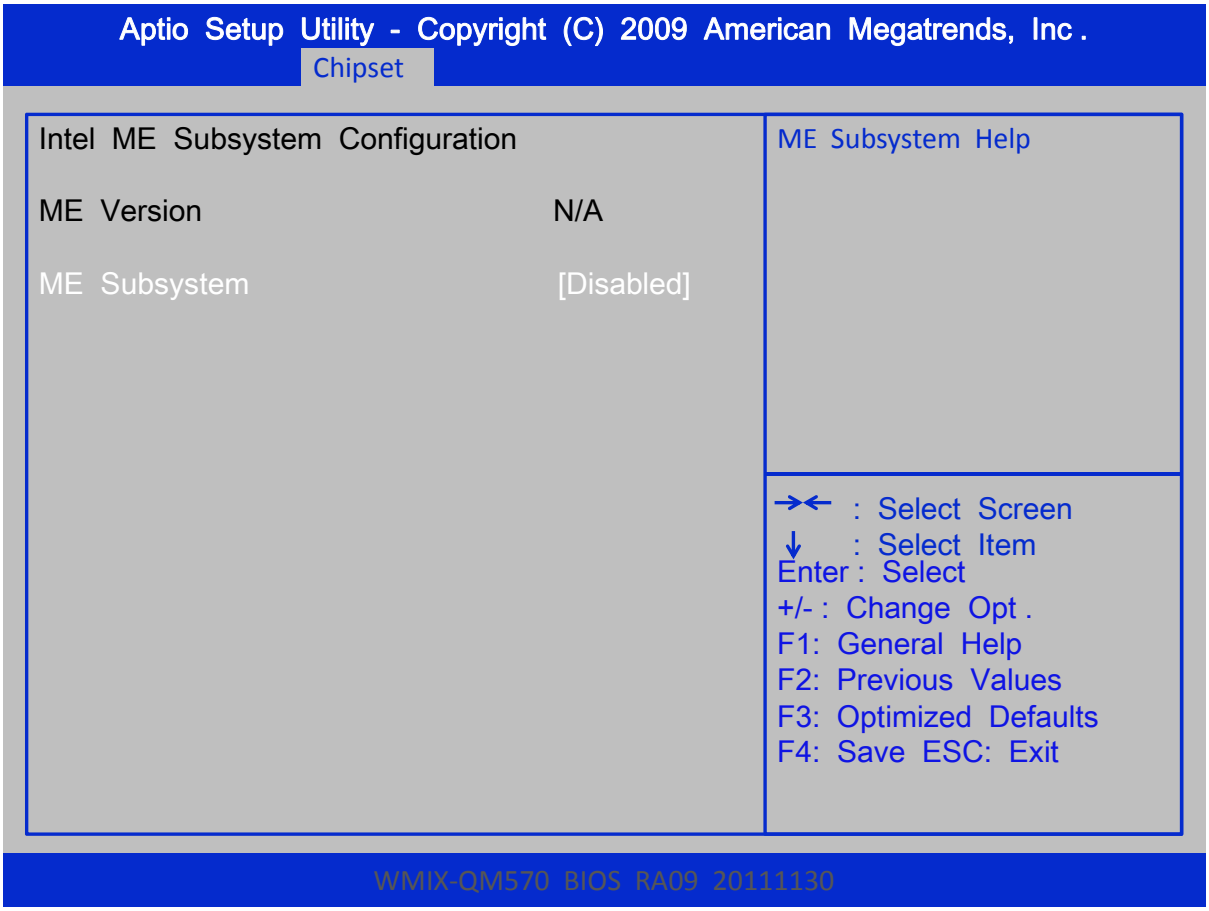
☐ **USB Port7**

☐ **USB Port8**

☐ **USB Port9**

☐ **USB Port10**

2.22 Intel ME Subsystem Configuration

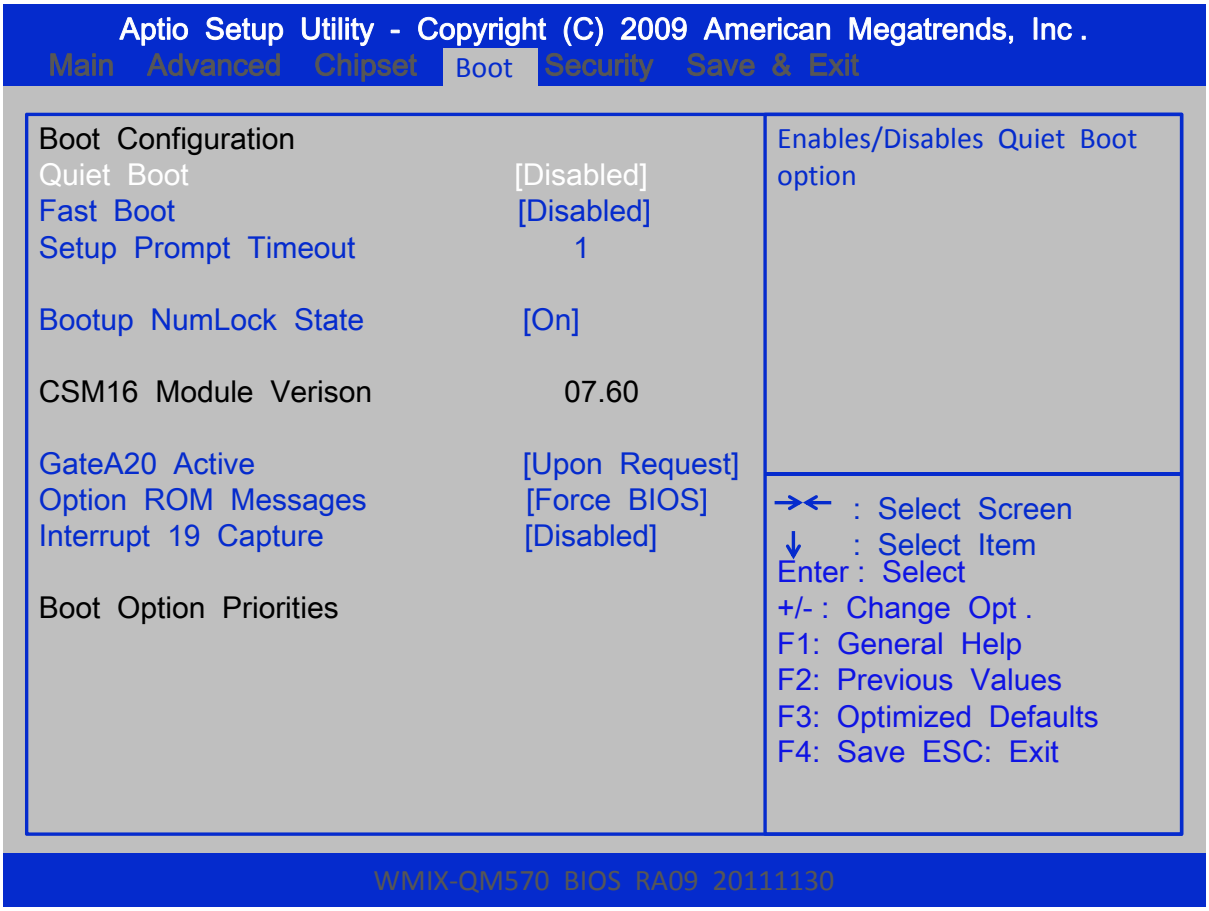


☐ **ME Version**

☐ **ME Subsystem**

Use this option to enable or disable the Intel® ME subsystem.

2.23 Boot Configuration


Aptio Setup Utility - Copyright (C) 2009 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
Boot Configuration
Quiet Boot [Disabled]
Fast Boot [Disabled]
Setup Prompt Timeout 1
Bootup NumLock State [On]
CSM16 Module Verison 07.60
GateA20 Active [Upon Request]
Option ROM Messages [Force BIOS]
Interrupt 19 Capture [Disabled]
Boot Option Priorities
Enables/Disables Quiet Boot option
→← : Select Screen
↓ : Select Item
Enter : Select
+/- : Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
WMIX-QM570 BIOS RA09 20111130

☐ **Quiet Boot**

This item can help to select the screen display when the system boots.

☐ **Fast Boot**

Enable/Disable boot with initialization of a minimal set of devices required to launch active boot option. Has no effect for BBS boot options.

☐ **Bootup NumLock State**

This setting is to set Num Lock status when the system is powered on.
Setting to [On] will turn on the Num Lock key when the system is powered on.
Setting to [Off] will allow users to use the arrow keys on the numeric keypad.
Choices: On, Off.

☐ **GateA20 Active**

Upon Request – GA20 can be disabled using BIOS services.

☐ **Option ROM Messages**

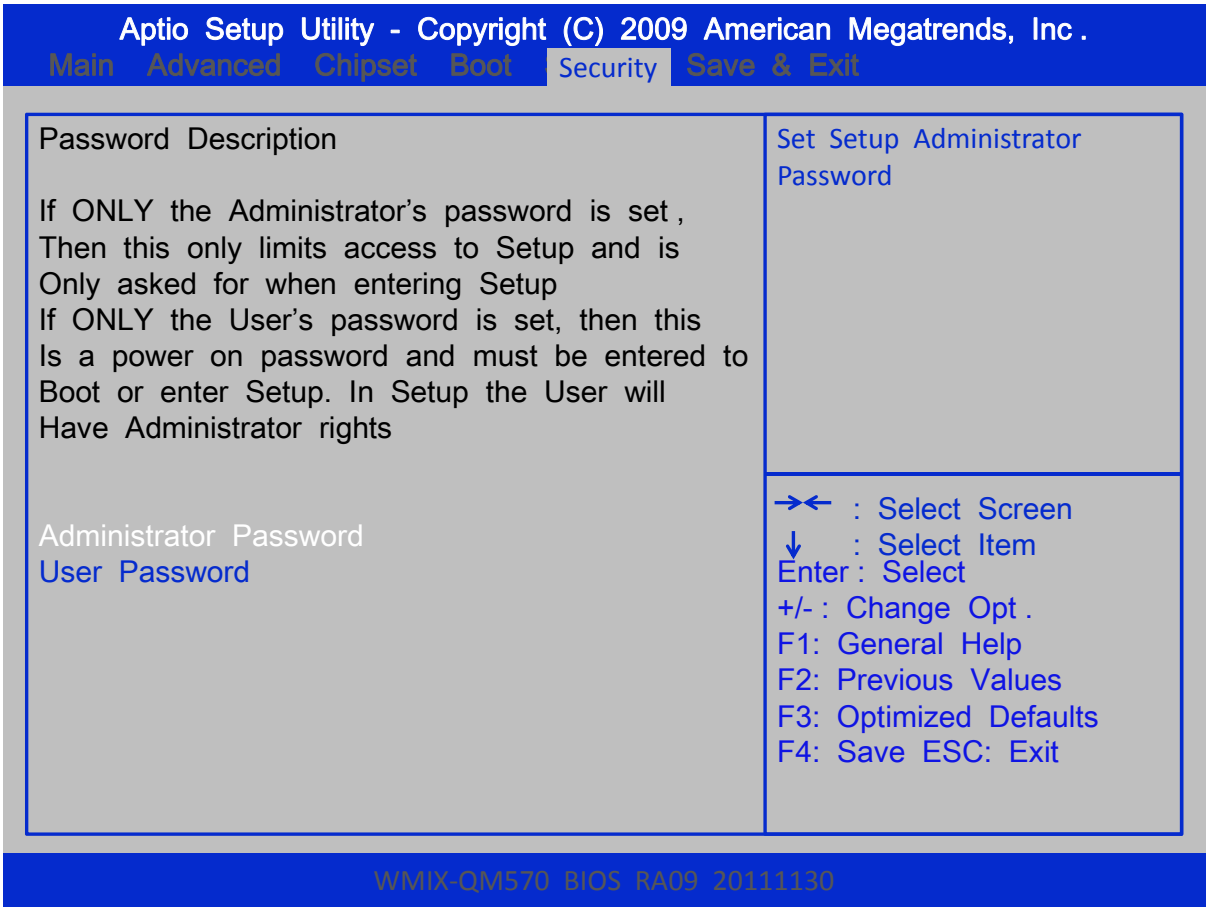
Set display mode for option ROM.

☐ **Interrupt 19 Capture**

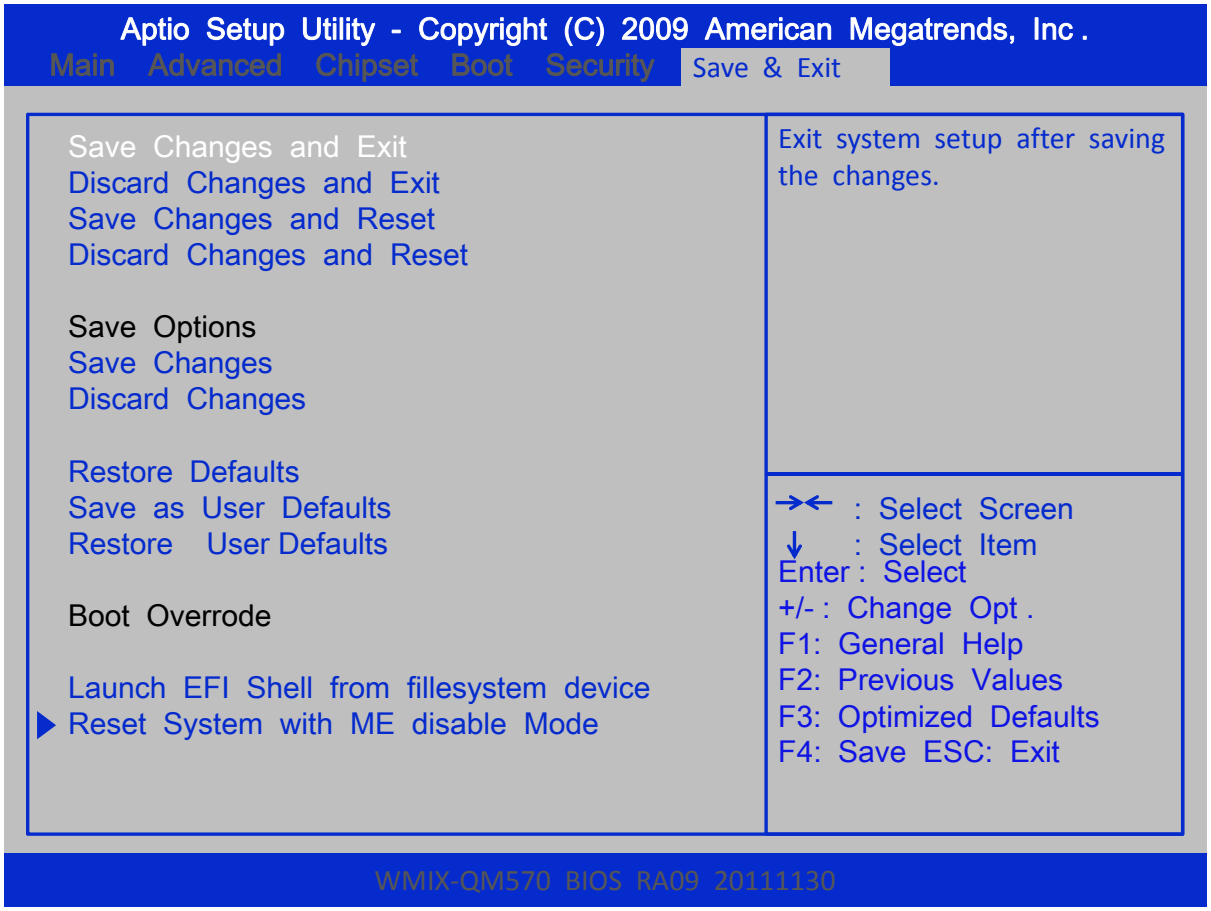
Enable: Allow option ROMs to trap int 19.

Choices: Disabled, Enabled.

2.24 Password Description


Aptio Setup Utility - Copyright (C) 2009 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
Password Description
If ONLY the Administrator's password is set, Then this only limits access to Setup and is Only asked for when entering Setup
If ONLY the User's password is set, then this Is a power on password and must be entered to Boot or enter Setup. In Setup the User will Have Administrator rights
Administrator Password
User Password
Set Setup Administrator Password
: Select Screen
: Select Item
Enter : Select
+/- : Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
WMIX-QM570 BIOS RA09 20111130

2.25 Save Changes and Exit


Aptio Setup Utility - Copyright (C) 2009 American Megatrends, Inc.
Main Advanced Chipset Boot Security Save & Exit
Save Changes and Exit
Discard Changes and Exit
Save Changes and Reset
Discard Changes and Reset
Save Options
Save Changes
Discard Changes
Restore Defaults
Save as User Defaults
Restore User Defaults
Boot Overrode
Launch EFI Shell from fillesystem device
Reset System with ME disable Mode
Exit system setup after saving the changes.
: Select Screen
: Select Item
Enter : Select
+/- : Change Opt.
F1: General Help
F2: Previous Values
F3: Optimized Defaults
F4: Save ESC: Exit
WMIX-QM570 BIOS RA09 20111130

Chapter 3 Drivers Installation

This chapter introduces driver installation information.

Please insert the utility CD to CD-ROM drive, the install menu will appear automatically, if the install menu did not list suitable driver of Operate System or did not appear automatically, please select corresponding driver of utility CD to install.

The Windows XP driver installation steps are as below.

3.1 Intel Chipset Device Software

Step 1. Click “Next” to continue.

Intel® Chipset Device Software
Intel® Chipset Device Software
intel
Welcome to the Setup Program
This setup program will install the Intel® Chipset Device Software onto this computer. It is strongly recommended that you exit all programs before continuing.
< Back
Next >
Cancel
Intel® Installation Framework

Step 2. Read the License Agreement and click “Yes” to continue.

Intel® Chipset Device Software
Intel® Chipset Device Software
License Agreement
intel
You must accept all of the terms of the license agreement in order to continue the setup program. Do you accept the terms?
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
Please Also Note:
* If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (IHV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies;
< Back
Yes
No
Intel® Installation Framework

Step 3. Click “Next” to continue.

Intel® Chipset Device Software
Intel® Chipset Device Software
Readme File Information
intel
Refer to the Readme file below to view the system requirements and installation information.
Press the Page Down key to view the rest of the file.
****
* Product: Intel(R) Chipset Device Software
* Release: Production Version
* Version: 9.2.0.1030
* Target Products: Intel(R) 6 Series/C200 Series Chipse
* 2nd generation Intel(R) Core(TM) pro
* Date: April 15 2011
****
< Back
Next >
Cancel
Intel® Installation Framework

Step 4. Click “Next” to continue.

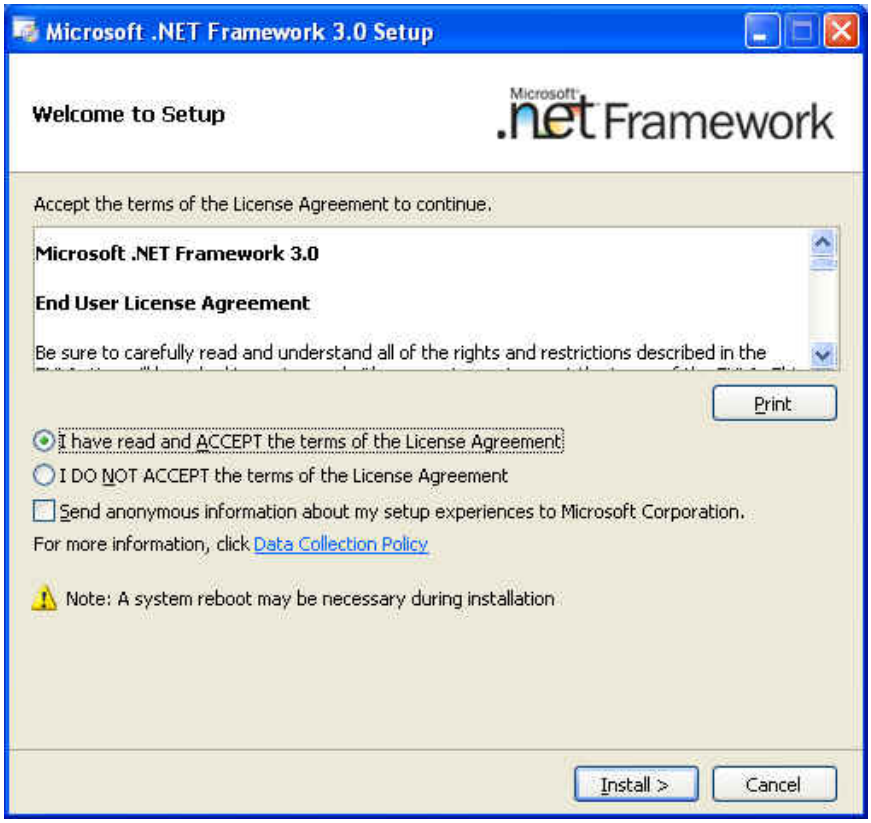
Intel® Chipset Device Software
Intel® Chipset Device Software
Setup Progress
Please wait while the following setup operations are performed:
Installing Driver: Intel(R) 5 Series/3400 Series Chipset Family SMBus Controller - 3B30
Version: 1.0.0.0002
Installing Driver: Intel(R) 5 Series/3400 Series Chipset Family USB Enhanced Host Controller -
Version: 9.1.1.1020
Installing Driver: Intel(R) 5 Series/3400 Series Chipset Family USB Enhanced Host Controller -
Version: 9.1.1.1020
Installing Driver: Intel(R) processor DRAM Controller - 0044
Version: 9.1.1.1022
Click Next to continue.
Next
Intel® Installation Framework

Step 5. Click “Finish” to complete setup.

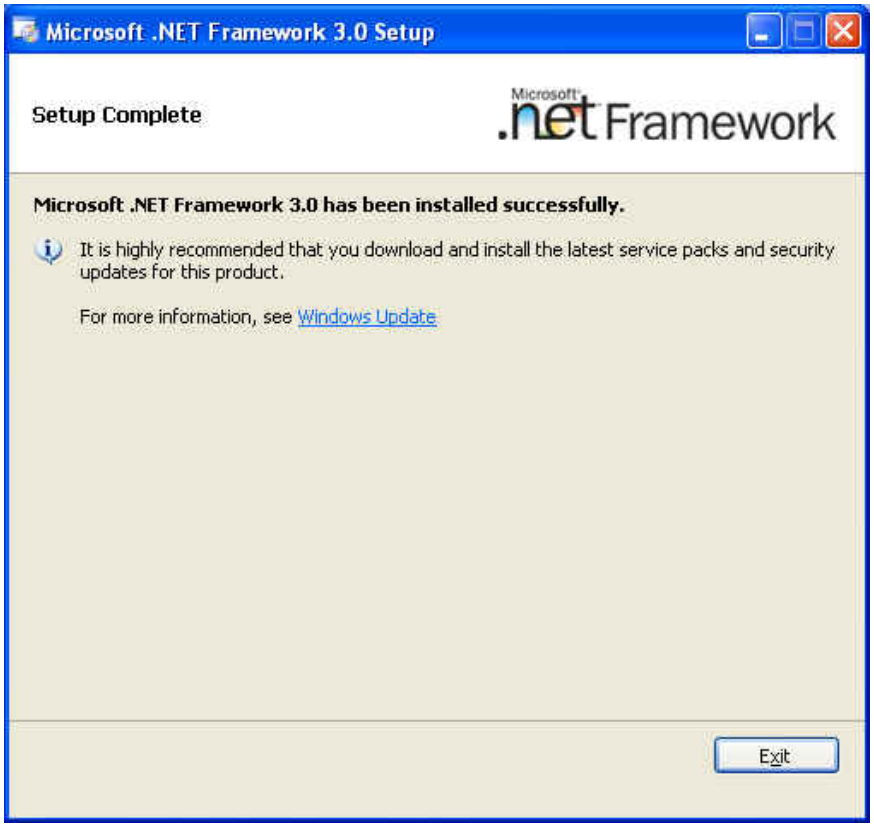
Intel® Chipset Device Software
Intel® Chipset Device Software
Setup Is Complete
You must restart this computer for the changes to take effect. Would you like to restart the computer now?
Yes, I want to restart this computer now.
No, I will restart this computer later.
Click Finish, then remove any installation media from the drives.
Finish
Intel® Installation Framework

3.2 Net Framework

Step 1. Click “Install” to continue.

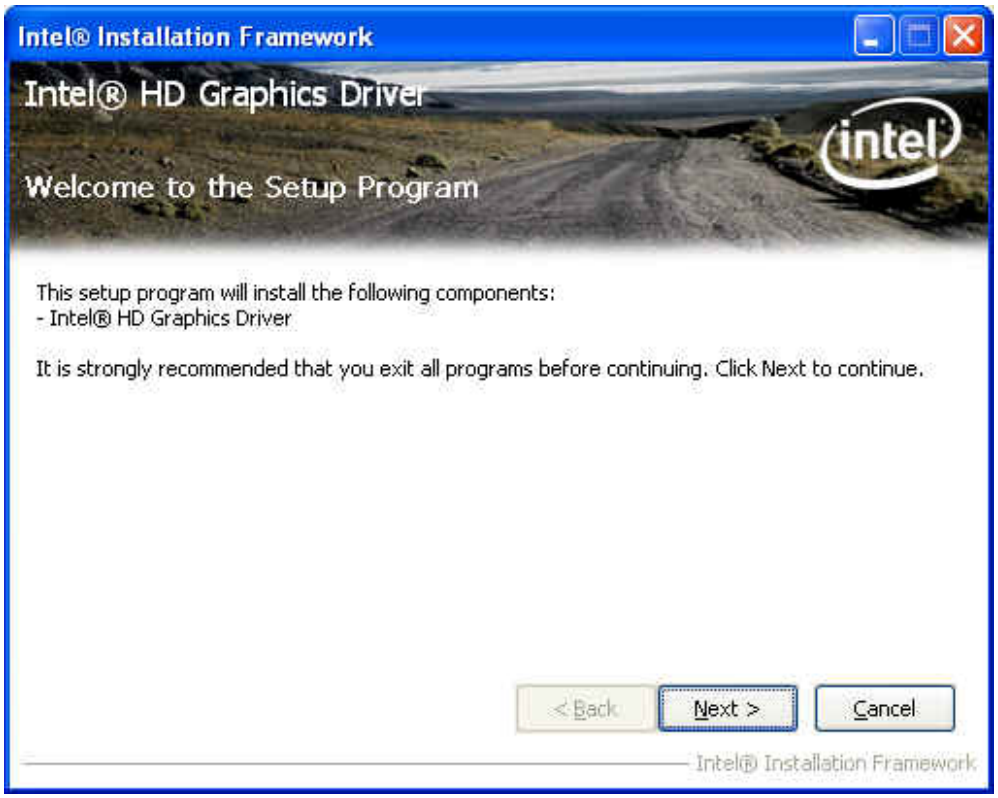

Microsoft .NET Framework 3.0 Setup
Welcome to Setup
Microsoft .net Framework
Accept the terms of the License Agreement to continue.
Microsoft .NET Framework 3.0
End User License Agreement
Be sure to carefully read and understand all of the rights and restrictions described in the
Print
I have read and ACCEPT the terms of the License Agreement
I DO NOT ACCEPT the terms of the License Agreement
Send anonymous information about my setup experiences to Microsoft Corporation.
For more information, click Data Collection Policy
Note: A system reboot may be necessary during installation
Install >
Cancel

Step 2. Click “Exit” to complete setup.


Microsoft .NET Framework 3.0 Setup
Setup Complete
Microsoft .net Framework
Microsoft .NET Framework 3.0 has been installed successfully.
It is highly recommended that you download and install the latest service packs and security updates for this product.
For more information, see Windows Update
Exit

3.3 Intel Graphic Media Accelerator Driver

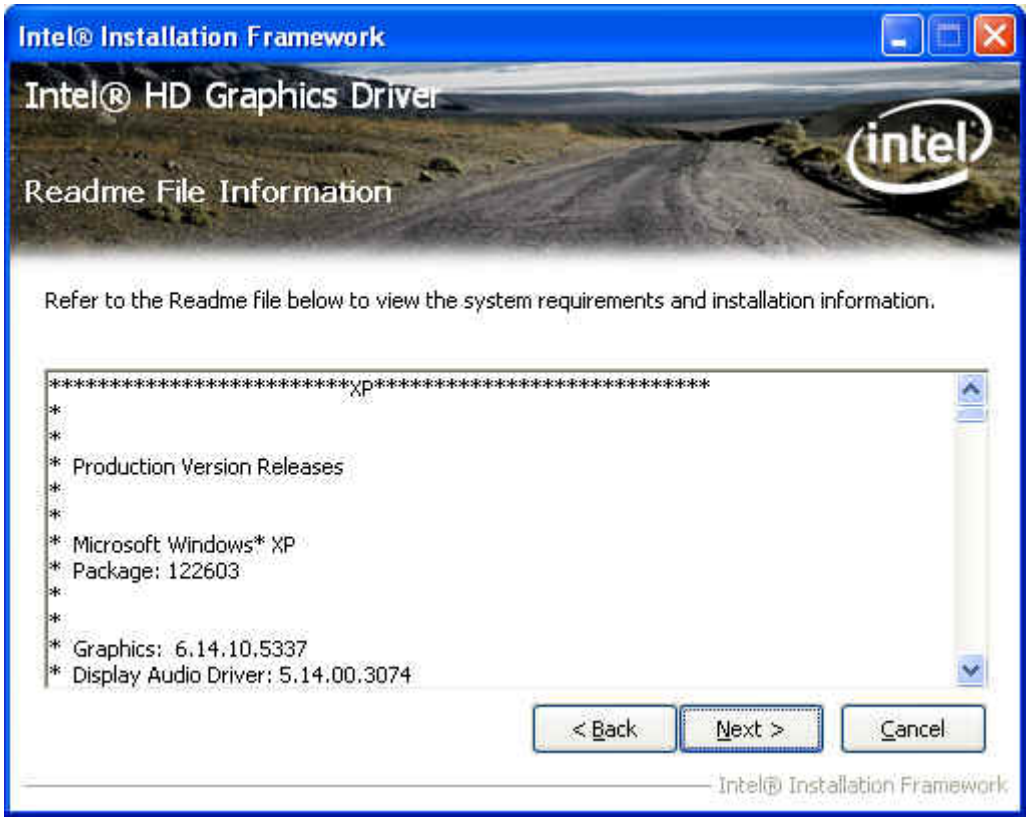
Step 1. Click “Next” to continue.


Intel® Installation Framework
Intel® HD Graphics Driver
Welcome to the Setup Program
intel
This setup program will install the following components:
- Intel® HD Graphics Driver
It is strongly recommended that you exit all programs before continuing. Click Next to continue.
< Back
Next >
Cancel
Intel® Installation Framework

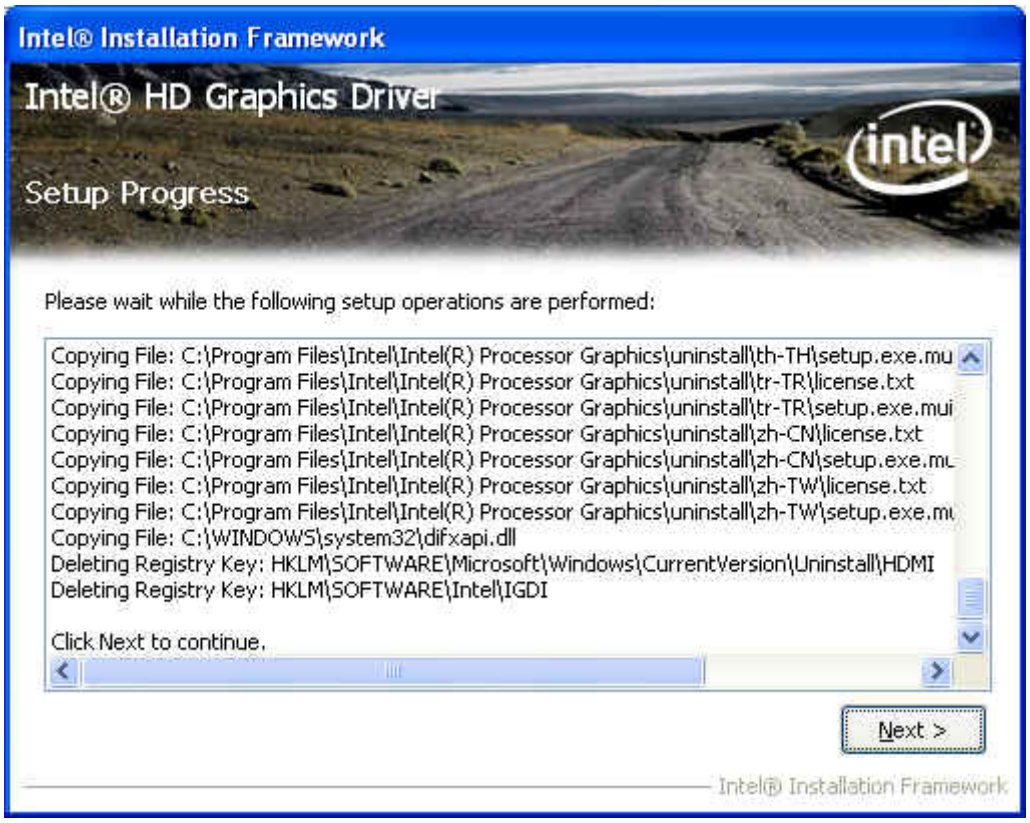
Step 2. Click “No” to continue.

Intel® Installation Framework
Intel® HD Graphics Driver
License Agreement
intel
You must accept all of the terms of the license agreement in order to continue the setup program. Do you accept the terms?
INTEL SOFTWARE LICENSE AGREEMENT (OEM / IHV / ISV Distribution & Single User)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the "Software") until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
Please Also Note:
* If you are an Original Equipment Manufacturer (OEM), Independent Hardware Vendor (IHV), or Independent Software Vendor (ISV), this complete LICENSE AGREEMENT applies;
* If you are an End-User, then only Exhibit A, the INTEL SOFTWARE LICENSE AGREEMENT,
< Back
Yes
No
Intel® Installation Framework

Step 3. Click “Next” to continue.



Step 4. Click “Next” to continue.

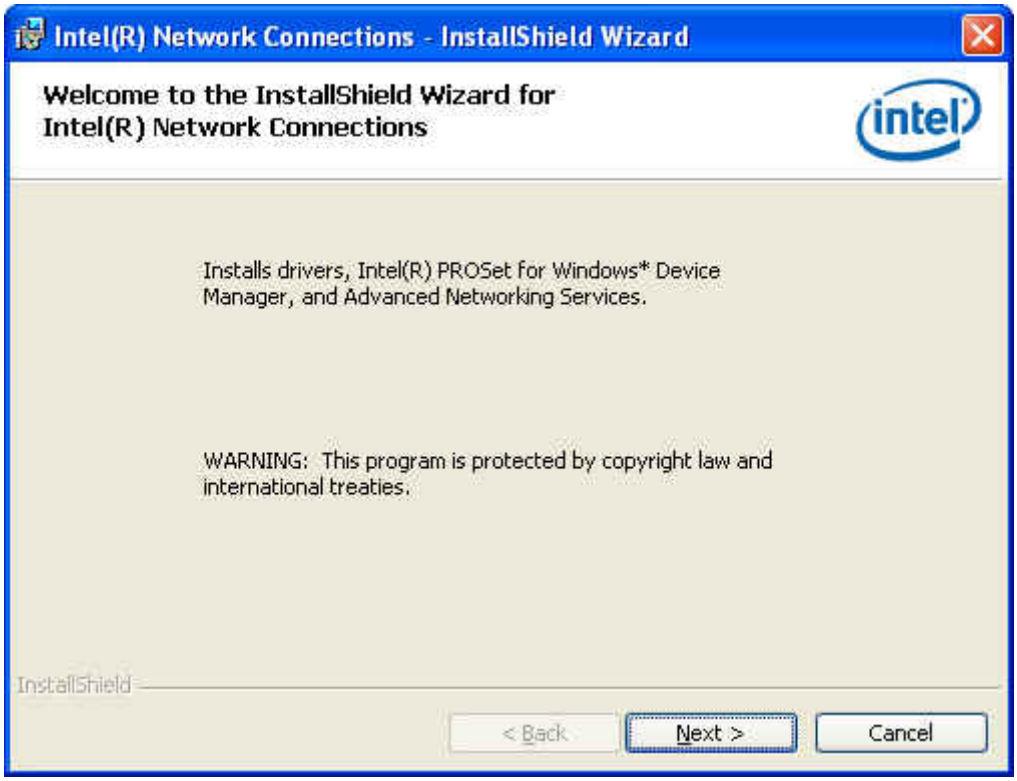

Intel® Installation Framework
Intel® HD Graphics Driver
Setup Progress
Please wait while the following setup operations are performed:
Copying File: C:\Program Files\Intel\Intel(R) Processor Graphics\uninstall\th-TH\setup.exe.mu
Copying File: C:\Program Files\Intel\Intel(R) Processor Graphics\uninstall\tr-TR\license.txt
Copying File: C:\Program Files\Intel\Intel(R) Processor Graphics\uninstall\tr-TR\setup.exe.mui
Copying File: C:\Program Files\Intel\Intel(R) Processor Graphics\uninstall\zh-CN\license.txt
Copying File: C:\Program Files\Intel\Intel(R) Processor Graphics\uninstall\zh-CN\setup.exe.mu
Copying File: C:\Program Files\Intel\Intel(R) Processor Graphics\uninstall\zh-TW\license.txt
Copying File: C:\Program Files\Intel\Intel(R) Processor Graphics\uninstall\zh-TW\setup.exe.mu
Copying File: C:\WINDOWS\system32\difxapi.dll
Deleting Registry Key: HKLM\SOFTWARE\Microsoft\Windows\CurrentVersion\Uninstall\HDMI
Deleting Registry Key: HKLM\SOFTWARE\Intel\IGDI
Click Next to continue.
Next >
Intel® Installation Framework

Step 5. Click “Finish” to complete setup.

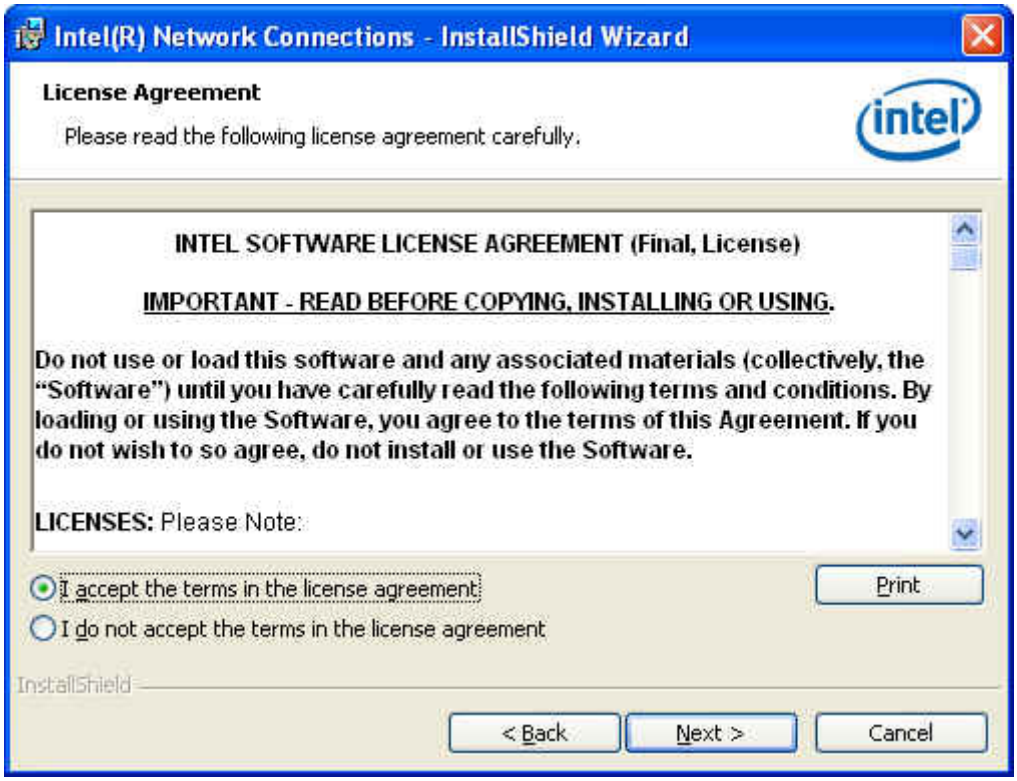
Intel® Installation Framework
Intel® HD Graphics Driver
Setup Is Complete
intel
You must restart this computer for the changes to take effect. Would you like to restart the computer now?
Yes, I want to restart this computer now.
No, I will restart this computer later.
Click Finish, then remove any installation media from the drives.
Finish
Intel® Installation Framework

3.4 LAN Driver

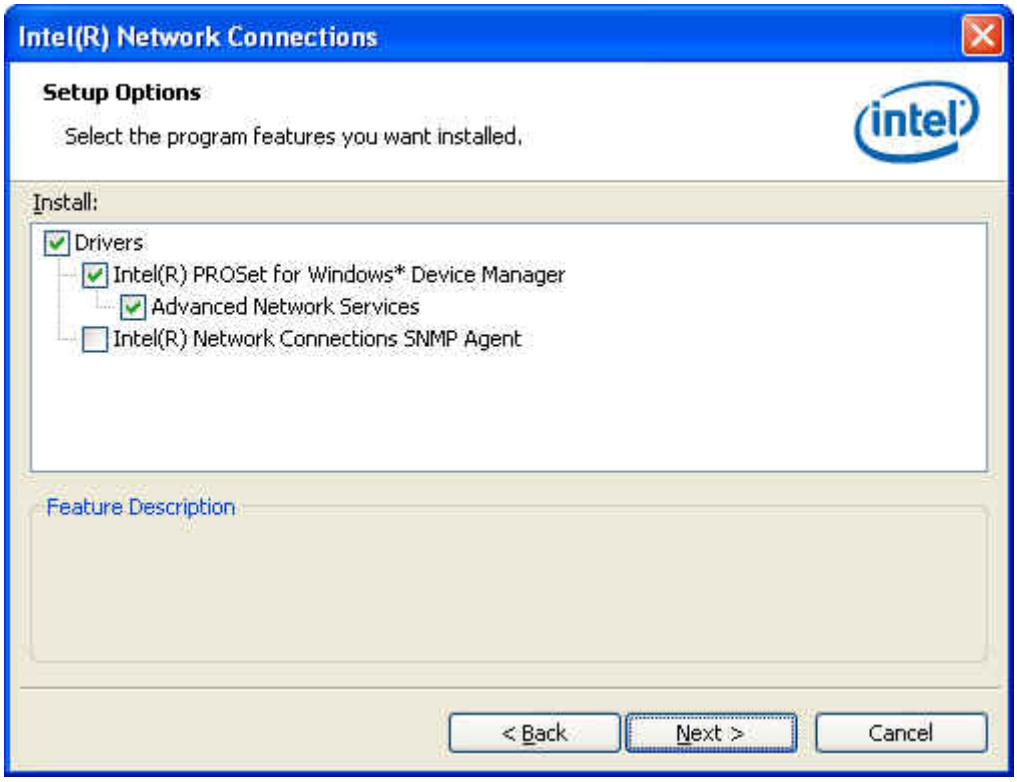
Step 1. Click “Next” to continue.


Intel(R) Network Connections - InstallShield Wizard
Welcome to the InstallShield Wizard for Intel(R) Network Connections
Installs drivers, Intel(R) PROSet for Windows* Device Manager, and Advanced Networking Services.
WARNING: This program is protected by copyright law and international treaties.
InstallShield
< Back
Next >
Cancel

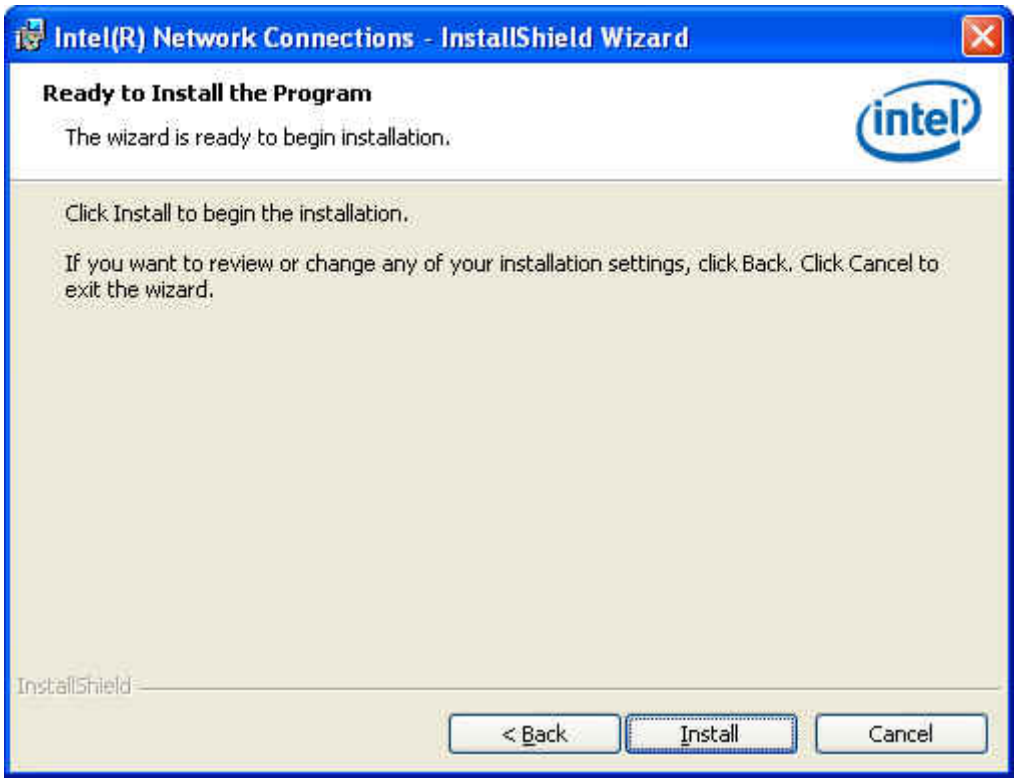
Step 2. Click “Next” to continue.


Intel(R) Network Connections - InstallShield Wizard
License Agreement
Please read the following license agreement carefully.
INTEL SOFTWARE LICENSE AGREEMENT (Final, License)
IMPORTANT - READ BEFORE COPYING, INSTALLING OR USING.
Do not use or load this software and any associated materials (collectively, the “Software”) until you have carefully read the following terms and conditions. By loading or using the Software, you agree to the terms of this Agreement. If you do not wish to so agree, do not install or use the Software.
LICENSES: Please Note:
I accept the terms in the license agreement
I do not accept the terms in the license agreement
Print
InstallShield
< Back
Next >
Cancel

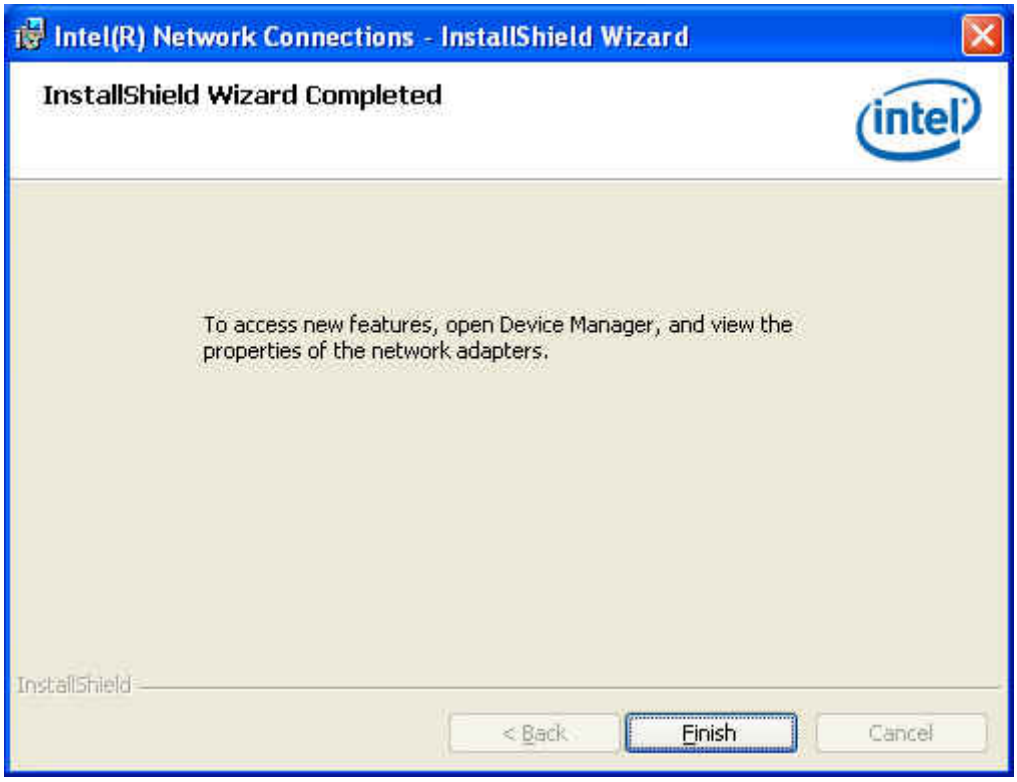
Step 3. Click “Next” to continue.



Step 4. Click “Install” to continue.

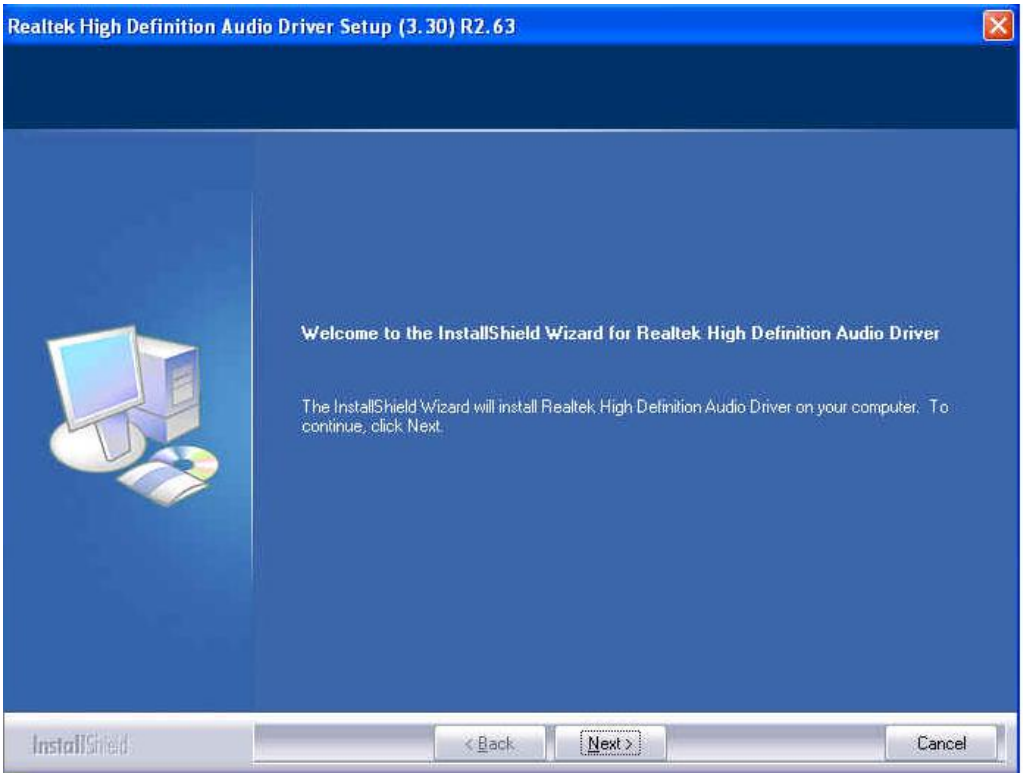

Intel(R) Network Connections - InstallShield Wizard
Ready to Install the Program
The wizard is ready to begin installation.
Click Install to begin the installation.
If you want to review or change any of your installation settings, click Back. Click Cancel to exit the wizard.
InstallShield
< Back
Install
Cancel

Step 5. Click “Finish” to complete setup.

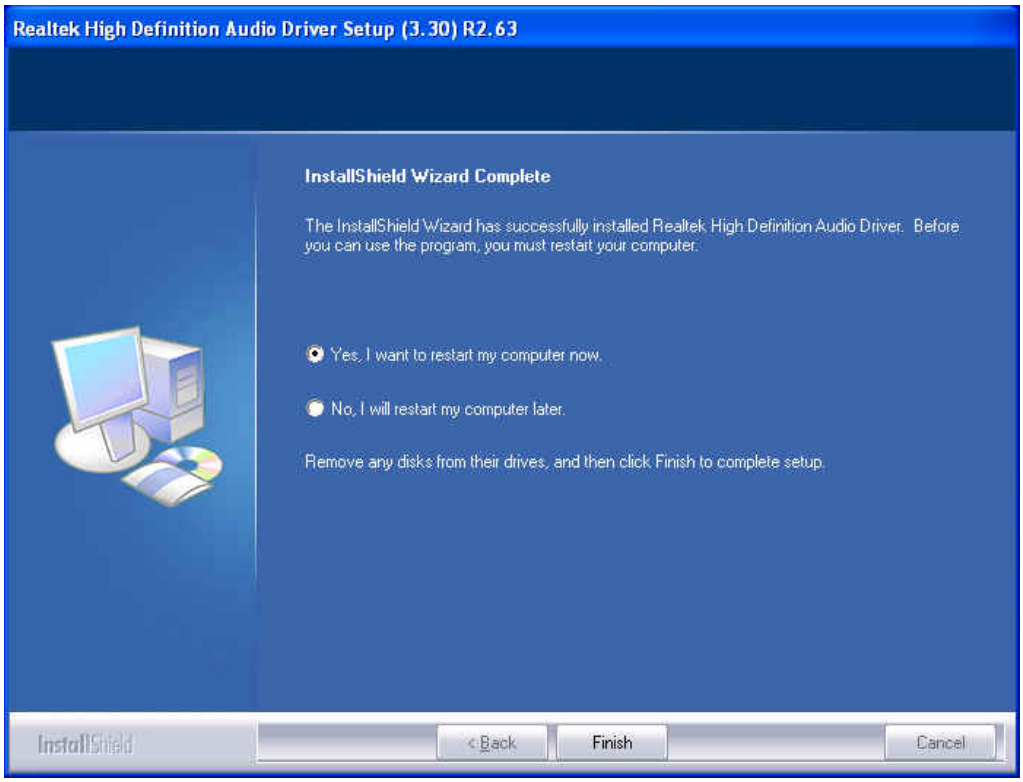


3.5 Audio Driver

Step 1. Click “Next” to continue.


Realtek High Definition Audio Driver Setup (3.30) R2.63
Welcome to the InstallShield Wizard for Realtek High Definition Audio Driver
The InstallShield Wizard will install Realtek High Definition Audio Driver on your computer. To continue, click Next.
InstallShield
< Back
Next >
Cancel

Step 2. Click “Finish” to complete setup.


Realtek High Definition Audio Driver Setup (3.30) R2.63
InstallShield Wizard Complete
The InstallShield Wizard has successfully installed Realtek High Definition Audio Driver. Before you can use the program, you must restart your computer.
Yes, I want to restart my computer now.
No, I will restart my computer later.
Remove any disks from their drives, and then click Finish to complete setup.
InstallShield
< Back
Finish
Cancel

Appendix-A Watchdog

The working algorithm of the WDT function can be simply described as a counting process. The time-out Interval can be set through software programming. The availability of time-out interval is set by software.

The System Board allows users control WDT through dynamic software programming. The WDT starts counting when it is activated. It sends out a signal to system reset, when time-out interval ends. To prevent the time-out interval from running out, a re-trigger signal will need to be sent before the counting reaches its end. This action will restart the counting process.

WDT program should keep the counting process running under normal condition. WDT should never generate a system reset unless the system runs into troubles.

The related Control Registers of WDT are all included in the following sample program that is written in C language. User can fill a non-zero value into the Time-out Value Register to enable/refresh WDT. System will be reset after the Time-out Value to be counted down to zero. Or user can directly fill a zero value into Time-out Value Register to disable WDT immediately.

To ensure a successful accessing to the content of desired Control Register, the sequence of following program codes should be step-by-step run again when each register is accessed.

For more information about WDT, please refer to Winbond W83627EHF data sheet.

There are two PnP I/O port addresses that can be used to configure WDT,

1) 0x2E: EFIR (Extended Function Index Register, for identifying CR index number)

2) 0x2F: EFDR (Extended Function Data Register, for accessing desired CR)

Below are some example codes, which demonstrate the use of WDT.

```
// Enter Extended Function Mode
outp(0x002E, 0x87);
outp(0x002E, 0x87);

// Assign Pin 77 to be a WDTO# Signal
outp(0x002E, 0x2D);
outp(0x002F, inp(0x002F) & 0xFE);

// Select Logic Device 8
outp(0x002E, 0x07);
outp(0x002F, 0x08);

// Active Logic Device 8
outp(0x002E, 0x30);
outp(0x002F, 0x01);

//Clear WDTO# Status
outp(0x002E, 0xF7);
outp(0x002F, inp(0x2F) & 0xEF);

// Select Count Mode (Second / Minute)
outp(0x002E, 0xF5);
outp(0x002F, (inp(0x002F) & 0xF7) | ( Count-mode Register  & 0x08));

// Set Time-out Value
outp(0x002E, 0xF6);
outp(0x002F,  Time-out Value Register );

// Exit Extended Function Mode
outp(0x002E, 0xAA);
```

Definitions of Variables:

Value of Count-mode Register:

1) 0x00 -- Count down in seconds (Bit3=0)

2) 0x08 -- Count down in minutes (Bit3=1)

Value of Time-out Value Register:

1) 0x00 -- Time-out Disable

2) 0x01~0xFF -- Value for counting down

Appendix-B GPIO

The System Board provides 4 dedicated output ports and 4 programmable I/O ports that can be individually configured to perform a simple I/O function. Users can configure 4 programmable I/O ports to become an input or output port by programming register bit of I/O Selection .*To invert port value, the setting of Inversion Register has to be made* (Note). Port values can be set to read or write through Data Register.

Note: Only 4 programmable I/O ports support.

Additionally, 4 Digital Output ports amplified signals from GPIO ports. There are open-drain buffers, which can offer greater driving capacity up to 100mA.

For more information about GPIO, please refer to Winbond W83627EHF data sheet.

The related Control Registers of GPIO are all included in the following sample program that is written in C language. To ensure a successful accessing to the content of desired Control Register, the sequence of following program codes should be step-by-step run again when each register is accessed.

There are two PnP I/O port addresses that can be used to configure GPIO ports,

1) 0x2E - EFER (Extended Function Enable Register, for entering Extended Function Mode)
   - EFIR (Extended Function Index Register, for identifying CR index number)

2) 0x2F - EFDR (Extended Function Data Register, for accessing desired CR)

Below are some example codes, which demonstrate the use of GPIOs.

```
// Enter Extended Function Mode
outp(0x002E, 0x87);
outp(0x002E, 0x87);

// Assign Pin121-128 to be GPIO port
outp(0x002E, 0x29);
outp(0x002F, inp(0x002F) | 0x01);
```

```
// Select Logic Device 7
outp(0x002E, 0x07);
outp(0x002F, 0x07);

// Active Logic Device 7
outp(0x002E, 0x30);
outp(0x002F, 0x01);

// Select Inversion Mode
outp(0x002E, 0xF2);
outp(0x002F, (inp(0x002F) & 0x3C) | ( Inversion Register  & 0xC3));

// Select I/O Mode
outp(0x002E, 0xF0);
outp(0x002F, (inp(0x002F) & 0x3C) | ( I/O Selection Register  & 0xC3));

// Access GPIO ports
outp(0x002E, 0xF1);
outp(0x002F, (inp(0x002F) & 0x3C) | ( Output Data  & 0xC3));
or
 Input Data  = inp(0x002F);

// Exit Extended Function Mode
outp(0x002E, 0xAA);
```

Definitions of Variables:

Each bit in the lower nibble of each Register represents the setting of a GPIO port.

Super IO Pin	Bit	GPIO DIO
128	0	GPIO DIO-Out0
127	1	GPIO DIO-Out1
126	2	GPIO DIO-In0
125	3	GPIO DIO-In1
124	4	GPIO DIO-In2
123	5	GPIO DIO-In3
122	6	GPIO DIO-Out2
121	7	GPIO DIO-Out3

Value of Inversion Register:
When set to a '1', the incoming/outgoing port value is inverted.
When set to a '0', the incoming/outgoing port value is the same as in Data Register.

Value of I/O Selection Register:
When set to a '1', respective GPIO port is programmed as an input port.
When set to a '0', respective GPIO port is programmed as an output port.

Value of Output Data / Input Data:
If a port is assigned to be an output port, then its respective bit can be read/written.
If a port is assigned to be an input port, then its respective bit can be read only.

Note:
DIO_IN0/DIO_IN1/DIO_IN2/DIO_IN3 is programmed as **Inputs** by BIOS default.

Parameter	Conditions
VinH	min +1.857V
VinL	max +0.525V
Rated Vin	-8V ~ +12V
NC Status	High by Default

** Attention: If **DIO_IN0/DIO_IN1/DIO_IN2/DIO_IN3 is programmed as Output signal, they can only offer a normal signal transfer (NOT amplified signals).**

Parameter	Conditions
VoutH	3.3V thru 10k
VoutL	0V thru 1k

DIO_OUT0/DIO_OUT1/DIO_OUT2/DIO_OUT3 is fixed as **Outputs** by BIOS.

Parameter	Conditions
Open-drain buffer	Power-on default = Open
Driving Capacity	max 100mA continue